Social Capital and Financial Development after Economic Shocks: Evidence from Italy after the Financial Crisis of 2007-2009

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Abstract

Like traditional forms of capital, social capital – an intangible measure of an individual's social networks, trust in institutions, and participation in civic life – has implications for personal and financial behavior. Individuals from educated, well-established backgrounds with fruitful family ties may be more amenable to opening new lines of credit or investing in stock markets due to their trust in and connectedness with society. But what happens after a major economic shock, such as the financial crisis of 2008? Using Italy as a case study and panel data from the Survey of Household Income and Wealth, we find that social capital has significant effects on an individual's credit card usage, informal borrowing, and choice to invest in securities.

Introduction

"Laws at best can prescribe only a small fraction of the day-by-day activities in the marketplace. When trust is lost, a nation's ability to transact business is palpably undermined."

- Alan Greenspan (2007)

Social relationships play a fundamental role in gaining access to and using financial instruments. For example, a relationship with a stock broker allows for the easy conversion of wealth into stocks; participation in some professional unions offers resources on financial literacy; or belonging to a family that has good credit may lead to increased access to loans in the future. These relationships form part of what has come to be known as one's social capital: this intangible form of capital encompasses social networks, bonds formed by shared identities, and community engagement. Social capital can be found in many contexts, from nepotistic hiring practices to community development.

Financing can be considered as trust-intensive contracts because the occurrence of the exchange depends not only on the legal enforceability of contracts but also on the extent to which the financier trusts the finance (Guiso et al. 2004). One way social capital drives financial development is by enhancing the prevailing level of trust and strength of social networks: communities, families, or social groups that are more tightly-knit have higher levels of social capital and are also shown to be more trusting (Coleman 1990). Because social capital is an important determinant of trust, it should also influence household financial participation, a household's willingness to participate in financial institutions and use financial instruments. Furthermore, when interpersonal and institutional trust decrease after a financial crisis, an individual's level of social capital should play a significant role in affecting development after the crisis. Therefore, in this paper we will examine the relationship between the level of social capital and financial participation after the 2007-2009 financial crisis. More specifically, using Italian household data from 2002 to 2016, we will analyze how high levels of

endowed social capital may mitigate the expected decline in household utilization of financial instruments.

The 2007-2009 Financial Crisis, considered the worst financial crisis since the Great Depression, was a great shock to global financial markets including Europe. The crisis surfaced in the summer of 2007 when the interbank market evaporated as a result of each bank's uncertainty of their counterparts' viability due to heavy investments in complex financial products. Therefore, banks faced a liquidity problem as they struggled to cover short-term debt. The subprime mortgage bubble eventually burst with the dramatic fall of Lehman Brothers in September 2008 exposing the fragility of the US and European banking systems. The crisis continued in a self-reinforcing downward spiral as banks were forced to restrain credit, economic activity plunged, and credit was cut even further. As the downturn in the asset market and credit crunch continued globally, world trade decreased – by as much as 15% in multiple quarters – and firms saw their sales plummet, setting the stage for a global recession (European Commission 2009).

In Italy, governments reacted to the crisis by supporting Italian banks while the European Central Bank (ECB) cut the discount rate. The recession that had already engulfed the Italian economy before the collapse of Lehman Brothers continued for several years until the 4th Quarter of 2014 (Di Quirico 2010). Italian banks reduced available credit and raised collateral requirements for new loans, thereby reducing even further investments in capital and houses. Spending decreased and many sectors responded by laying off workers. Italy's regions were not hit evenly; as in 2009, Lombardia and Veneto recorded the largest number of bankruptcies at 1,963 and 880 respectively (Coletto 2010). Although Italy's GDP has registered anemic growth – less than 1.5%, since 2014 – banking has largely returned to normal, as its CET1 position, a measure of capital adequacy, has nearly doubled from 7.1% to 13.8% since 2008 (Banca D'Italia 2017. Questions about the solvency of several Italian banks which together

with the slow recovery and the extremely high level of Italy's debt/GDP ratio contribute to raise major concerns about the future of the Italian economy and stability of its financial system.

The events of 2007-2009 were largely out of control of the average individual; in fact, the crisis was seen as a failure on the part of governments, banks, credit rating agencies and financial sector. Individuals who had once trusted these institutions grew skeptical. In the US, over 50% of citizens trusted banks a great deal or quite a lot in the years before the recession; this statistic would fall to a low of 22% by 2009 (Gallup). In the United States, trust in big business, Congress, and organized labor fell similarly from pre-recession levels. In Europe, trust in the European Central Bank (ECB) reached a peak in early 2007, with 54% of respondents indicating trust in the ECB. The level of trust then proceeded to fall constantly to a low of 31% in 2014 (Eurobarometer). There is no doubt that the lasting memory of the crisis is still fresh in the minds of many households in Europe, as many had their careers, homes, and lives upended. The crisis also underscored the instability of many financial instruments and institutions used daily by citizens, surprising many who considered large the European banks, its products, and the financial markets well regulated and supervised. According to European surveys, Italians, in particular, have had an inherent distrust in their government already before the crisis: the European Commission's Eurobarometer indicates that 15% of Italian respondents trusted their government at the onset of the recession in 2008-09, down from 30% in 2007. Compared to other EU countries, Italy is also one of the most distrusting of the Union itself: in the 2014 Eurobarometer results, Italy's distrust in the EU is only eclipsed by that of Spain, Greece, Turkey, and the UK. Considering both institutional and interpersonal trust as one of the chief outcomes of high levels of social capital, it can be inferred that social capital took a significant hit across the EU and in Italy specifically after the recession. Following Fukuyama (1995), Putnam (1994), and Guiso et al. (2004), we will examine Italy, as it serves as an important case study in the field of social capital and has readily available data on financial participation.

Literature Review

Origins of Social Capital

Social Capital is an abstract and complex concept drawn from a varied epistemological origin, but our analysis is largely built upon the work of Putnam and Coleman. We follow the work of both authors in viewing social capital as the productive result of social networks, structure, and organization that enable social actions. Coleman (1988) likened social capital to other forms of capital, in that "social capital is productive, making possible the achievement of certain ends that in its absence would not be possible."[1] Putnam (1994), reiterated this point, stating that social capital represents the "features of social organization, such as trust,[2] norms, and networks, that can improve the efficiency of society by facilitating coordinated actions."[3] Another highly productive component of social capital is the norm of generalized reciprocity, which refers to a continued relationship of exchange that involves the mutual expectation that any value provided will be repaid in the future (Putnam 1994). A third component, networks of civic engagement, facilitates communication and the flow of information as well as fostering the norms or reciprocity and generalized trust between individuals. It is through these networks that reputations can be conveyed and updated after events such as financial crises. Additionally, according to Putnam, social capital endowments are highly persistent over centuries, and that "stocks of social capital, such as trust, norms, and networks, tend to be self-reinforcing and cumulative," meaning they are not easily erased by crises.[4]

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[1] Pg. 302

[2] It is important to note that "trust" in these foundational works of social capital refers to "generalized trust" (trust in other members of society) which is an umbrella term for other types of trust such as particularized trust (trust in those an individual knows or identifies with) and institutional trust (trust in institutions).

[3] Pg. 167

[4] Pg. 177

Our work will build upon a body of literature that posits a relationship between social capital and economic development. Helliwell and Putnam (1995) show that, holding initial income constant, Italian regions with a more developed "civic community", measured by a composite index of newspaper readership, the density of sports and cultural associations, turnout in referenda, and the incidence of preference voting, had higher growth rates over the 1950-1990 period. Other researchers have also identified generalized trust as integral to the functioning of market economies (Arrow 1972, Ostrom 2015). Knack and Keefer (1997) find empirical evidence suggesting there is a positive correlation between a nation's level of trust and its rate of growth post measurement of trust, using two measures of trust: a mean value of generalized trust from answers to the World Values Survey question "Can people generally be trusted?" and a composite index of civic cooperation norms constructed from several other questions. Fukuyama (1995) argued that social capital, namely trust, increases market efficiency and leads to a more successful economy by lowering transaction costs in a comparative case study of economic organization and development between high trust and low trust societies. The most pertinent study to our research was conducted by Guiso et al. (2004), who follow Putnam and Fukuyama, using Italy as a case study. They found that high levels of social capital promoted financial development by increasing the likelihood of using checks, improving portfolio allocation in terms of total wealth held in stocks and cash, and raising access to credit. They also found that the effects of possessing high levels of social capital were magnified if the individual lived in an area with a poor judicial system or had a low education level.

Measuring Social Capital

In their 2004 study, Guiso et al. decided to measure social capital – an amalgamation of networks, civic engagement, and interpersonal connections – using pooled electoral participation and blood donation data. While the findings were concrete, perhaps the greatest shortcoming of this study is

the use of only two proxy variables – voter turnout and blood donations – in approximating social capital. While these measures certainly address the volunteerism and civic engagement aspects of the social capital definition, they fail to cover the social network aspect, which we will incorporate using a host of new variables.

In a 2003 paper written by Micucci et al. and published by the Bank of Italy, the authors use a similar method to Putnam's *Bowling Alone* (2000) to create a social capital index for regions of Italy. Armed with an arsenal of social capital proxy variables, the authors set out to construct an index using the Principal Component Analysis (PCA) technique. They use 35 different variables, divided into three categories: measures of participation in non-profit organizations, indicators related to trust and civic engagement, and measures of informal sociability. These categories encompass the breadth and essence of the many aforementioned definitions of social capital. We aim to follow a comparable methodology to Micucci et al. in selecting social capital proxies and constructing an index using PCA, though we update the methodology to account for availability of data and economic rationale when choosing the variables.

Social Capital and Economic Crises

There is limited research analyzing the link between social capital and financial crises. Rothstein & Stolle (2002) show that perceptions of institutional safety and corruption are strongly linked with institutional trust and in turn with generalized trust. Other researchers have found links between financial situations and trust. Lindstrom and Giordano (2016) discovered that measures of generalized trust decreased after the 2008 financial crisis, using panel data from the British Household Panel Survey. Knell and Stix (2010) identify certain variables, such as an individual's valuation of their current and future financial situations, as important levers of trust. Another study used eight surveys from the Netherlands between 2006 and 2013 to show that unfavorable experiences during the financial crisis not

only directly lowered trust in banks but also has had a negative effect on generalized trust (Van de Cruijsen et al. 2016). That paper also demonstrates that those who were customers of a bank that failed had a more dramatic decrease in generalized trust than respondents whose banks did not fail. Ananyev and Guriev (2014) found that in Russia a 10% decrease in income was associated with a 5% decrease in trust following 2008. To our knowledge, no study has combined financial crises experiences and the link between social capital and financial development to examine the differential effect of social capital on the use of financial tools after a crisis.

Theoretical Framework

To understand the connection between social capital and usage of financial instruments after a crisis, we begin by sketching a simple model. Putnam (1994) stated that social capital has features of trust, norms, and networks, but he later goes on to add that the "most important of these norms that undergird social trust"[5] is reciprocity and that "networks of civic engagement facilitate communication and improve the flow of communication about the trustworthiness of individuals."[6] Therefore, while social capital of an individual is a function of trust (T_i), norms (R_i), and networks (N_i), trust can be modeled as a function of simply norms and networks.

$$\text{Social Capital} = f(T_i, R_i, N_i) \tag{1}$$

$$\text{Trust} = f(R_i, N_i) \tag{2}$$

The following example details the decision of how much of its total wealth a household will invest in stocks, but the general framework can be applied to other financial decisions. Let household i's demand for securities be modeled by

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[5] Pg. 172
[6] Pg. 174

$$S_i = f(E, C_i) \tag{3}$$

where S_i is the percent of total wealth the head of household invests in securities, E is the expected return for the investment, and C_i is the individual characteristics of the household head, such as risk aversion or financial literacy, that affect portfolio choice. Assume that the broker the household uses will flee with the money with some probability π. In the context of a financial crisis, this can be a theft from a broker, a market crash, or a bank failure that results in the loss of the invested wealth. Thus, if the investor suspects that he will lose his money, the expected return for an investment yielding return r is

$$E = \pi(0) + (1 - \pi)r = (1 - \pi)r \tag{4}$$

We can think of the level of generalized trust an investor has in the broker as an expectation of the broker's behavior. The broker, entrusted with the investor's assets, faces a decision to follow through with the contract or abscond with the investor's money. This can be modeled by the broker's utility function where a_i {0, 1} reflects whether the broker absconds or not, N_j is the level of networks in the area, R_i is the norms of the broker, and k_i is the fixed cost of absconding for the agent. We would expect that broader social networks and stronger norms lead brokers to derive less utility from stealing their clients' money. However, there is a cost threshold $\hat{I}_i = \hat{I}(N_j, R_i)$ under which the broker would rationally steal their client's money. The broker's choice to abscond is thus given by

$$a_i^* = \{1 \text{ if } I_i < \hat{I}_i, 0 \text{ otherwise}\} \tag{5}$$

To simplify things, let us assume there are only two broker types, R_H and R_L where $R_H > R_L$ is a type with stronger social norms and is thus less likely to lose the money. Since the distribution of broker types will vary across areas, let p_j denote the proportion of R_L types in the population of area j. This is better thought of as the relative strength of norms in area j. Thus the probability that a broker in area j flees with the money is given by $\pi_j = h(p_j, N_j)$. This probability can be inputted into the investor's expected return and demand for stock equations to result in

$$S_i = f(1 - \pi_j)r, C_i) = f((1 - h(p_j, N_j))r, C_i) = l((r, p_j, N_j, C_i) \qquad (6)$$

Therefore, demand for stock will increase in areas with broader social networks (N_j) and higher

proportions of brokers with stronger norms (p_j).

Financial crises enter these equations in several ways. First, the expectations of the market and

market volatility impact the expected return of investment in stock. Secondly, concerns about the

financial stability of banks and financial intermediaries are comparable to a broker absconding,

increasing π and π_j. Thus in areas harder hit by bank bailouts and failures, or areas with higher

proportions of R_L brokers that are more likely to lose their clients' money, we can anticipate the

expected return of investment in securities to be lower and thus the demand for those securities as well.

Additionally, unfavorable experiences with the financial system, resulting from poor banking products

such as subprime mortgages or an inability to withdraw money from bank accounts during the credit

squeeze, could also negatively impact trust for other individuals as these experiences are relayed through

networks.

While this model specifies investments and broker-client behavior, we also intend to examine

informal loans as a measure of financial participation. There are several ways in which we can expect

social capital to impact the presence of informal credit following a financial crisis. First, borrowing from

friends and family can be a substitute when formal means are either unavailable or too expensive.

Because borrowing, as a financial contract, is affected by social capital, we can expect the quantity of

informal loans to increase in low social capital areas. Next, there may be a substitution effect wherein

low social capital individuals switch from formal borrowing to the next most trusted borrowing option,

informal credit, when trust in formal sources diminishes. Finally, several authors, including Fukuyama

(1995) and Banfield (1967), have pointed to high degrees of broader network closure as associated with

high levels of trust in subgroups, such as the family.

The proposed theoretical model does have several limitations for our purposes. Firstly, it addresses the choice to invest in stocks which is a very specific example that can't necessarily be extrapolated to financial instruments such as loans. Secondly, trust only enters this equation in the form of interpersonal trust, or "particularized trust"; while trust in the broker is important, trust in financial institutions is of equal significance in measuring generalized trust. Finally, as we noted in the literature review, social capital and trust are intimately connected but not synonymous. This model uses R_i and N_j to approximate the social norms of the broker and the networks in the area, respectively, but fails to include any explicit variables for trust, civic and political engagement, and other factors of social capital that would make the model more holistic.

Data

We have three main groupings for our variables: measures of financial participation, regional and household controls, and social capital proxies. The objective is to construct a social capital index using PCA and to see how that index affects financial participation before and after 2008, controlling for potential confounding factors. As aforementioned, the focus of this study is on Italy due to the sustained damages of the global financial crisis and prior literature elaborating the role of social capital in Italy. Including the islands of Sicilia and Sardegna, the country is composed of 20 distinct regions; it is these regions that will ultimately be used to merge the datasets. Additionally, we will refer to the Italian regions by their local designations to be consistent with the data provided.

Measures of Financial Participation

Italy's Survey of Household Income and Wealth is a biannual study that provides household level financial data on income, saving and spending habits, and a number of background variables used as controls. The SHIW is administered by the Bank of Italy and samples roughly 8,000 households

across all regions, comprising around 20,000 individuals in total. The SHIW survey results make up an unbalanced panel dataset: some households are part of a panel dataset, while others are dropped or introduced to the sample in each sequential survey. Since approximately 8,000 households are surveyed each even year, there are roughly 64,000 observations for the 8 even years between 2002 and 2016, inclusive. This dataset also provides information on movers – individuals with a region of birth that differs from their region of residence – who account for 15.3% of the households in the dataset. Since the survey was administered on a household basis but includes data for all individuals within that household, we dropped all individuals that did not represent the "head of household" according to the corresponding indicator in the data. The head of household then becomes a proxy for the household's earnings, savings habits, and financial participation.

The SHIW includes hundreds of questions about spending habits, usage of financial instruments, breakdown of income, and other matters of personal finance. We used a combination of economic rationale and data analysis to narrow down our measures of financial participation to only 3 variables: *CreditCard, Securities,* and *InformalLoans*. While initially interested in Bancomat cards as well as credit cards, credit is more intimately tied to trust and the theme of social capital whereas Bancomat cards, introduced to Italy more recently, are comparable to debit cards. We also investigated households that applied for loans and the results of those applications; however, informal borrowing too is more strongly linked to social norms and networks.

Finally, we examined several variables that could be used in proportions, such as a securities-to-deposits ratio or a cash spent-to-consumption ratio. However, respondents were often inconsistent with their answers, reporting annual consumption values that regularly rose above income, for example, which corrupted the ratio variables. For these variables, the SHIW asks individuals to report large and arcane numbers on the spot, such as income or cash spent per month, with no way of corroborating the

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data. Thus, a degree of skepticism should be used when viewing these SHIW responses, as data are subject to two forms of response bias: either respondents may inflate their reported levels of wealth, income, or savings, or they may simply not know. As one might expect, data for a variable like monthly expenditures clusters around hundreds values, presumably because respondents are using a rounding or estimation technique when answering.

Given the drawbacks with some of the potential dependent variables, we made it a goal to select robust variables to represent financial participation as these will have more accurate responses. The dependent financial participation variables gleaned from the SHIW dataset are detailed below with summary statistics found in Table 1:

- *CreditCard:* This is a binary variable equal to 1 if the respondent household owns a credit card. As one of the most ubiquitous financial instruments, credit cards should have a utilization driven by high social capital, as proven by Guiso et al. (2004). Only 30% of respondents reported owning at least one credit card, as Italy is a country that still relies heavily on cash, debit cards, and checks.

- *InformalLoans:* This is an indicator variable that equals 1 if an individual is a borrower with outstanding loans to friends and family. About 2.5% of survey respondents reported having an outstanding informal loan.

- *Securities:* The SHIW delineates financial assets into four categories: deposits, government securities, other securities (consisting of bonds, Italian investment funds, ETF's, Italian Shares and equity, managed portfolios, foreign securities, and cooperative loans) and trade credit. Thus our variable is the proportion of financial assets in government and other securities. On average, 17.5% of a household's wealth is invested in securities. The lower number of observations for this variable is likely a source of individuals not knowing or electing to omit their answer.

Table 1. Financial Variable Summary Statistics

Variables	(1) N	(2) Mean	(3) S.D.	(4) Min.	(5) Max.
CreditCard	60,266	0.300	0.458	0	1
InformalLoans	63,417	0.025	0.157	0	1
Securities	52,288	0.175	0.316	0	1

Regional and Household Controls

Control variables from both the household and regional levels are used. From the SHIW, we find variables for the number of members in a household; the age, sex, marriage status, and education of the head of household; whether the head of household has been employed in the financial sector or insurance industry; the natural log of the real household income and wealth reported by the head of household in thousands of 2018 euros; and the town size in which the household resides. Finally, the data have been cleaned to eliminate the 23 households reporting negative income and the 6 households with negative consumption. From i.Stat, Italy's National Institute of Statistics, we get average GDP by region in thousands of euros to control for regional differences in income. Finally, we include indicator variables for even years between 2002 and 2016, corresponding to the years of SHIW responses. Summary statistics for all important variables are shown in Table 2, including social capital, which will be discussed later, and regional breakdowns are shown in the appendix (Table A3). The SHIW gives the household's region of residence as well as the region of birth of the household head. We calculate social capital for both, and, on average, people tend to be moving from lower social capital regions to higher social capital regions, explaining the difference in means between Social Capital and Social Capital of Birth. Table 3 shows a correlation matrix for the household and regional control variables.

Table 2. Control Variable Summary Statistics

Variables	(1) N	(2) Mean	(3) S.D.	(4) Min.	(5) Max.
Social Capital	63,417	0.0845	0.876	-1.397	1.515
Social Capital of Birth	59,878	-0.0297	0.864	-1.397	1.515
Members	63,417	2.472	1.265	1	12
Age	63,417	58.76	15.80	17	104
Town Size	63,417	1.350	0.976	0	3
Male	63,417	0.578	0.494	0	1
Married	63,417	0.614	0.487	0	1
Education	63,417	9.274	4.562	0	20
Employed in Finance	63,417	0.0273	0.163	0	1
Log Real Income	63,264	3.348	0.694	-7.451	7.151
Log Real Wealth	60,490	4.629	1.894	-6.804	10.38
Region GDP	63,417	25,740	6,397	13,996	38,624

Table 3. Control Variable Correlations

Control Variables	Members	Employed in Finance	Education	Male	Married	Log Real Income	Log Real Wealth	Region GDP
Members	1							
Employed in Finance	0.017	1						
Education	0.186	0.161	1					
Male	0.211	0.067	0.120	1				
Married	0.591	0.035	-0.033	0.401	1			
Log Real Income	0.358	0.143	0.431	0.225	0.353	1		
Log Real Wealth	0.114	0.091	0.247	0.134	0.192	0.555	1	
Region GDP	-0.128	0.465	0.139	0.028	-0.048	0.240	0.113	1

Social Capital Proxy Variables

Since social capital has such a nebulous definition in the first place, it is best approximated with a wide range of variables that encompass trust, civic engagement, and social networks. Thus we aimed to find as many variables that encompass the many dimensions of social capital in order to create a regional social capital index. We used a study by Micucci et al. (2003) as a starting point: in their appendix, they describe 35 social capital variables and their sources. However, some of these variables were too vague or similar to another variable, while others were not related to social capital by our definitions and understanding. Eliminating variables systematically from this study's list left 21 proxies for social capital. Using the remaining list of variables and adding on several others from different literature and data sources, we selected the following datasets and proxies.

A. National Institute of Statistics (i.Stat): Italy's Institute of Statistics publishes the results of many surveys that it conducts annually or biannually on daily life and time. However, some of the surveys were either started recently or have gaps – 2004 is often missing from these datasets – so years of availability are shown in Table A1 in the appendix. It is important to note that some data include a minimum age of 6 while others have a minimum age of 14; ideally, the minimum age here would be consistent but without the microdata, it is impossible to discern among respondents. Regardless, the number of respondents who were minors was marginal. The 10 variables from i.Stat used in the index, *religious_observance, social_activity_cultural, social_activity_volunteering*, *reading_newspapers*, *political_information, political_activities*, *meeting_friends*, *interpersonal_trust*, *posting_opinions*, and *social_networks*, are detailed further in table A2 in the appendix:

B. Organization for Economic Cooperation and Development (OECD): The OECD releases regional data for its 36 member countries every year. The variables cover anything from GDP to education levels to reported happiness. Of the many variables, the most pertinent to social capital were

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corruption_perception and *social_network_perception* because they cover individuals' perception about institutions and networks rather than facts.

C. Ministry of the Interior: Italy's Ministry of the Interior publishes voter turnout data by region for public use. In Italy, citizens are required to vote by law in general elections but not for the Senate and so *voter_turnout* for senate votes held in 2001, 2006, 2008, 2013, and 2018, is used, which is also corroborated by Micucci et al (2003). Surprisingly, voter turnout was relatively stable over this time span; though there were significant regional differences – in 2013, Calabria had a turnout of 63% while Emilia-Romagna reported 82% - the regions held relatively constant across years.

With all 13 of the social capital proxies listed above, we noticed distinct regional differences but consistency over time. At first this result is surprising, as one might expect civic engagement or political participation to change following a recession. However, this supports the theory that social capital is in fact endowed: if a region has a high level of social capital in 2002, its level of social capital will still be high in 2014. Furthermore, we are chiefly concerned with the ordinal, or relative, level of social capital in a region, compared to other regions. Veneto, as an example, has very high values for many of the social capital proxies, when compared to Calabria. It is their difference that is pertinent to our studies rather than their absolute levels of social capital. Because these proxies did not vary much over time within regions, the variables are averaged over the available years and attached to the household observation for each respective region. Summary statistics for the social capital proxy variables by region can be found in table A3 in the appendix.
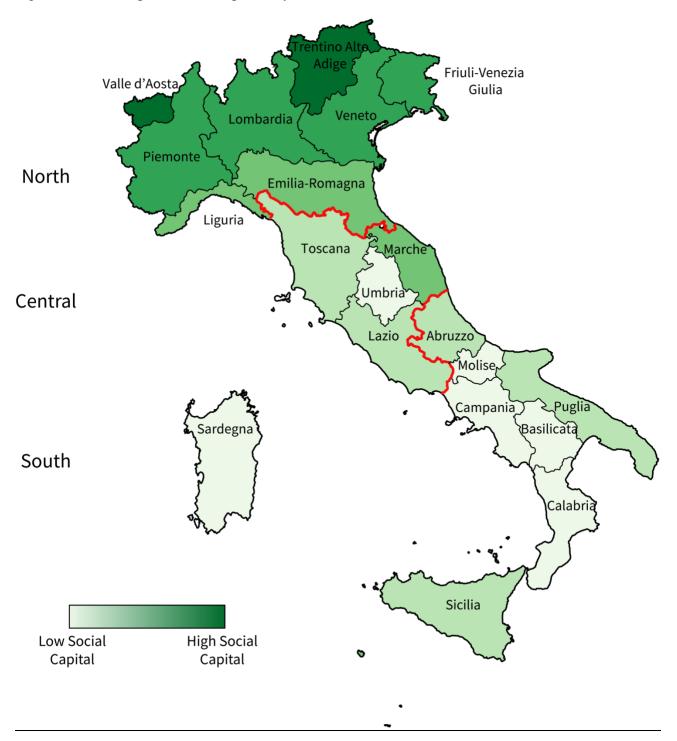
Constructing the Social Capital Index

Principal Component Analysis (PCA) is common method for computing an index by reducing the dimensionality of a set of variables with minimal loss of information. This particular multivariate

statistical procedure normalizes data through mean centering and then substitutes principal components, which are derived from a set of orthogonal transformations of the related variables. Here, important information is defined as that which has a significant impact on the variance of the target variable. For our purposes, most notably PCA was used by Putnam (2000) in his book *Bowling Alone* to index US states, by Micucci et al. (2003) to create a social capital index of Italy's regions, and by the staff of Utah Senator Mike Lee in 2018 to elaborate on Putnam's work and construct an updated state-by-state social capital index for the US.

The resulting index is depicted quantitatively in appendix Table A3 and graphically below in Figure 1. Although the PCA output is not an exact value of social capital, it provides a relative ranking for each region, where more positive index values represent higher levels of social capital. These estimates echo previous findings by Banfield (1967), Putnam (1994), and Guiso et al. (2004) that find high concentrations of social capital endowment in the North, indicated by darker shades of green. It is interesting to note as well that the social capital index does not generally vary over time, especially in the pre-crisis and beginning of post-crisis period. This affirms the belief that social capital, a product of norms and networks – two quantities that do not change considerably over time – is similarly endowed.

Figure 1. Social Capital Index Map of Italy

Empirical Specification

We are interested in analyzing the marginal effect of social capital after a financial crisis on 3 dependent variables relating to credit, loans, and investments. Thus, we will regress our social capital index, a number of household control variables, and GDP per capita by region on each of these dependent variables separately. The crux of this paper rests on uncovering the combined effect of a crisis and a particular level of social capital on an individual's financial participation. To do this, we will use an interaction term between *Crisis*, an indicator equal to 1 if the year is 2010 or later, and the social capital index. We are specifically scrutinizing the interaction term for sign and significance: seeing as theory and literature suggest the impact of a crisis on financial participation to be attenuated by higher social capital, we would anticipate the interaction coefficient to be positive and significant. Thus the following regression model is executed:

$$Y = \beta_0 + \beta_1 \cdot SC_{ijt} + \beta_2 \cdot Crisis_{ijt} + \beta_3 \cdot SCCrisis_{ijt} + \beta_{4\text{-}12} \cdot HH\_Control + \beta_{13} \cdot Reg\_GDP_{jt} + \varepsilon \qquad (1)$$

Y is a general term for any of our 3 SHIW financial variables of interest: *Credit Card, Securities,* and *Informal Loans*. SC_{ijt} is the social capital index of household i in region of residence j in year t. $Crisis_t$ is the aforementioned indicator for whether the observation came after 2009. $SCCrisis_{ijt}$ represents the interaction term between the two previous variables. The *HH_Control* term is a placeholder for all 9 of the household control variables noted in the data section, ranging from age of the household head to annual household income. Finally, Reg_GDP_{jt} represents the average GDP per capita for region j in that year. We run the following two regressions for each of the outcome variables as well:

$$Y = \beta_0 + \beta_1 \cdot SCB_{ijt} + \beta_2 \cdot Crisis_{ijt} + \beta_3 \cdot SCBCrisis_{ijt} + \beta_{4\text{-}12} \cdot HH\_Control + \beta_{13} \cdot Reg\_GDP_{jt} + \varepsilon \qquad (2)$$

$$Y = \beta_0 + \beta_1 \cdot SCB_{ijt} + \beta_{2\text{-}10} \cdot HH\_Control + \beta_{11} \cdot Reg\_GDP_{jt} + \beta_{12\text{-}18} \cdot Year + \varepsilon \qquad (3)$$

Here, (2) is the same as the original regression except it replaces *SC* with *SCB* and uses a new corresponding crisis interaction term. *SCB* stands for social capital of birth: some respondents were born

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in other regions before moving to their current region of residence. Since social capital is endowed and is a product of one's upbringing, it is reasonable to believe that the social capital of an individual's birthplace may be more representative of his or her true endowment. Regression (2) builds on regression (1) by introducing social capital of birth measures in place of the previous social capital of residence measures in order to eliminate the suspicion that some environmental variables other than social capital are driving the results. If the findings indicate that *Social Capital* and the *Social Capital Crisis* interaction term in (1) tend to be significant while *Social Capital of Birth* and the *Social Capital* and *Crisis* interaction term in (2) tend to be insignificant or vice versa, then we can reasonably conclude that there are confounding environmental variables that differ between region of birth and region of residence. Finally, (3) is a regression that uses year fixed effects in the form of dummy variables – *y02*, *y04*, *y06*, *y10*, *y12*, *y14* and *y16*, with *y08* excluded for collinearity – rather than a post-crisis term. This is to be able to discern specific effects from each year and general trends in the data pre and post crisis. Since *CreditCard* and *InformalLoans* are binary variables we employ a probit model while we use a zero one inflated beta model for *Securities* as it is a proportion.

Findings

I. Credit Cards

Guiso et al. (2014) examine the availability of credit to consumers as it relates to trust. While they use a different measure of credit instruments – the probability of applying for a loan and getting turned down – the same principles connect trust to credit card usage: individuals with a higher degree of institutional trust and social capital should be more willing to use credit cards. Furthermore, individuals who might be well connected and have strong networks are more likely to be financially literate and use credit cards to build credit. We anticipate a slight negative shock to credit card usage after the economic

crisis, as the population trusts financial institutions to a lesser degree and may substitute away from credit cards towards instruments like cash or debit cards. However, we anticipate this negative shock to be attenuated by higher endowments of social capital; thus, we predict a negative *Crisis* coefficient but a positive coefficient on the *Social Capital/Social Capital of Birth* and *Crisis* interaction terms. We also expect all control variables to have a positive effect on Credit Card possession.

Given the binary nature of the *Credit Card* outcome variable, a probit model was used to estimate the effect of social capital on credit card usage following a financial crisis. Table 4 shows the three primary regressions, with year indicator coefficients shown in the appendix in the interest of space. (1) and (2) have identical signs and significances and similar magnitudes for all coefficients except the crisis interaction term and *Log Real Wealth*. The positive and highly significant *Social Capital of Birth* and *Social Capital* coefficients indicate that social capital does positively affect usage of credit cards, and, while the interaction term is not significant in the case of social capital of birthplace, both interaction terms are positive as was anticipated. Interestingly, *Crisis* has a positive and statistically significant coefficient at the 0.01 level; this suggests that credit card usage continued to increase following 2008, as reaffirmed by the increasing year indicators in (3) (Table A5). All other control variables follow expectations, including *Members* and *Age, which* are both significant and negative. With regards to the control variables, credit card usage does appear to be positively impacted if a household's head is employed in the financial sector, indicated by *Employed in Financial Services* in (1) and (2). While the imputed pseudo R-squared values are low, this is to be expected due to the large variation from a survey like the SHIW.

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Table 4. Differential Effect of Social Capital on Possession of Credit Card

Variables	(1) Social Capital	(2) Social Capital of Birth	(3) Year Fixed Effects
Crisis	0.202***	0.223***	
	(0.0208)	(0.0209)	
Social Capital	0.111***		
	(0.0209)		
SC/Crisis Interaction	0.0383*		
	(0.0225)		
Social Capital of Birth		0.0942***	0.115***
		(0.0201)	(0.0171)
SCB/Crisis Interaction		0.0126	
		(0.0230)	
Members	-0.0839***	-0.0806***	-0.0810***
	(0.0125)	(0.0131)	(0.0131)
Age	-0.0296***	-0.0311***	-0.0317***
	(0.000972)	(0.00101)	(0.00102)
Married	0.168***	0.195***	0.198***
	(0.0309)	(0.0319)	(0.0319)
Town Size	0.0810***	0.0900***	0.0895***
	(0.0129)	(0.0133)	(0.0133)
Education	0.128***	0.129***	0.128***
	(0.00354)	(0.00365)	(0.00367)
Male	0.209***	0.221***	0.221***
	(0.0251)	(0.0258)	(0.0259)
Employed in Finance	0.859***	0.818***	0.819***
	(0.0648)	(0.0653)	(0.0653)
Log Real Income	1.146***	1.144***	1.153***
	(0.0282)	(0.0291)	(0.0293)
Log Real Wealth	0.132***	0.0950***	0.0945***
	(0.00833)	(0.00876)	(0.00878)
Region GDP	2.98e-05***	3.83e-05***	3.45e-05***
	(2.65e-06)	(2.56e-06)	(2.65e-06)
Constant	-6.218***	-6.198***	-6.049***
	(0.129)	(0.131)	(0.136)
Observations	57,722	54,882	54,882
Number of HH_ID	31,193	29,364	29,364
Pseudo R-Squared	0.240	0.277	0.282
Prob > χ^2	0.000	0.000	0.000

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

As mentioned earlier, our expectations aligned with the results with a few exceptions. Before 2010, 30.4% of our sample households owned a credit card; this figure fell to 29.6% in the post-crisis period. However, while credit card usage fell in absolute terms, it increased upon controlling for the similarly decreasing income and wealth factors. This could be a factor of increased fiscal responsibility following the crisis: if individuals are warier of their finances, they may be more inclined to use credit cards for their rewards. Additionally, cash spent per month, in real terms, fell by 100€ between 2010 and 2012; a decrease in generalized trust following the crisis may engender a substitution from cash to card. A contrasting explanation has to do with consumption effects: according to the SHIW data, average income in real terms fell 9.4% after the crisis while monthly consumption actually increased by 5.4%. Perhaps individuals employ credit cards as a means of increasing or maintaining their pre-crisis consumption levels despite a decrease in annual income. Regardless, it stands that social capital endowment has a significant effect on credit card usage, controlling for regional and household factors.

The coefficients for *Age* and *Members* are intriguing but make sense in the context of credit cards. For the former, larger households tend to be wealthier both in terms of tangible capital and social capital –*Members* and *Log Real Income* have a correlation of 0.358 – however, these households may be actually poorer in terms of income per household member. The data confirms this as the correlation between members and income per household member is highly negative. With regards to *Age*, while credit card usage certainly increases with age at first and peaks at ages 40-45, it tapers off once individuals reach 50. This is likely explained by credit cards representing a somewhat modern financial instrument and a relatively new phenomenon in Italy. While they became widely popular in the US in the 1960s, adoption in Europe has been more delayed; Italians over 50 may be slow to adopt a new payment instrument or have a preference for other forms of payment, such as cash or checks.

II.   Percent of Financial Assets in Securities

Another interesting variable of note in the percent of financial assets in securities. Because financial assets are split into deposits, securities, and trade credits, the percent of assets in securities is a proxy of the amount in securities versus the other categories. Since deposits are safeguarded up to 100,000€ in the European Union, they are the safest form of saving in the financial asset category. When institutional trust is low following a crisis, we would expect households to invest less in securities as it is the more trust-intensive form of investment and more in deposits as it is less trust-intensive.

Because the outcome variable is a proportion, we utilize a zero one inflated beta distribution (zoib) in the same three specifications to estimate the effect of social capital after the economic crisis. Whereas traditional solutions to modeling proportions require assumptions that proportions at zero and one are simply sampling zeroes, the zoib model allows for the presence of structural zeroes and ones as these are qualitatively different than other outcome proportions. In our case, we believe that the decision to invest zero percent of financial assets (roughly 72% of our sample) in securities is a conscious decision by households. Thus, the zoib model allows us to model our variables of interest on the proportion of financial assets in securities that equal zero as well as between the proportion between zero and one because they likely are generated from different processes. The outcome of the zoib model is listed in Table 5 with the model for proportions between zero and one is listed under "Proportion" and the model for the likelihood of investing zero percent in securities is listed under "Zero Inflate".

In the first specification, *Crisis* as predicted is statistically significant and negative, as households turn away from the securities market after the financial crisis. *Social Capital* is statistically significant and positive, indicating that as social capital increases, the percent of financial assets in securities is expected to increase. However, the *SC/Crisis Interaction* term is not statistically significant, indicating that there is no significant difference in the percentage invested in securities before and after

the financial crisis. The zero inflate regression suggests that individuals with higher social capital are also less likely to have zero percent of assets invested in securities. Most control variables are statistically significant and follow anticipated trends. *Age, Male, Education*, and whether the household head has been *Employed in Finance* all imply an increased percentage allocated to securities and that the household is less likely to have invested zero percent in securities. *Log Real Income*, *Log Real Wealth*, and *Region GDP* follow the same tendencies as well. Interestingly, *Town Size* is also expected to increase the likelihood of investing zero percent in securities, which is an idiosyncrasy of Italy as many of its small and medium size towns tend to be centers of wealth. SHIW data confirms this as *Log Real Wealth* decreases as town size increases, indicating that individuals in large population centers have less wealth to invest with.

Table 5. Differential Effect of Social Capital on Percent of Wealth in Securities

	Variables	(1) Social Capital	(2) Social Capital of Birth	(3) Year Fixed Effects
Proportion	Crisis	-0.0641***	-0.0521***	
		(0.0210)	(0.0202)	
	Social Capital	0.0426**		
		(0.0183)		
	SC/Crisis Interaction	0.00851		
		(0.0232)		
	Social Capital of Birth		0.0690***	0.0459***
			(0.0169)	(0.0147)
	SCB/Crisis Interaction		-0.0232	
			(0.0224)	
	Members	-0.0730***	-0.0731***	-0.0740***
		(0.0128)	(0.0130)	(0.0130)
	Age	0.00678***	0.00670***	0.00690***
		(0.000864)	(0.000870)	(0.000877)
	Married	0.0596**	0.0580**	0.0605**
		(0.0283)	(0.0287)	(0.0287)
	Town Size	0.00674	0.00761	0.00753
		(0.0105)	(0.0106)	(0.0106)
	Education	0.00710**	0.00653**	0.00764***
		(0.00277)	(0.00279)	(0.00281)

Male	-0.0517**	-0.0545**	-0.0573**
	(0.0223)	(0.0226)	(0.0226)
Employed in Finance	0.122***	0.117***	0.118***
	(0.0426)	(0.0432)	(0.0435)
Log Real Income	0.0312	0.0380	0.0328
	(0.0281)	(0.0284)	(0.0285)
Log Real Wealth	0.0691***	0.0667***	0.0705***
	(0.0112)	(0.0114)	(0.0114)
Region GDP	1.35e-05***	1.34e-05***	1.77e-05***
	(2.69e-06)	(2.61e-06)	(2.85e-06)
Constant	-0.733***	-0.732***	-0.989***
	(0.116)	(0.116)	(0.127)

Zero Inflate	Crisis	0.246***	0.254***	
		(0.0269)	(0.0263)	
	Social Capital	-0.238***		
		(0.0275)		
	SC/Crisis Interaction	0.0193		
		(0.0294)		
	Social Capital of Birth		-0.217***	-0.185***
			(0.0256)	(0.0220)
	SCB/Crisis Interaction		-0.0229	
			(0.0293)	
	Members	0.259***	0.253***	0.252***
		(0.0180)	(0.0185)	(0.0187)
	Age	-0.00522***	-0.00446***	-0.00611***
		(0.00115)	(0.00117)	(0.00120)
	Married	-0.0495	-0.0505	-0.0472
		(0.0401)	(0.0406)	(0.0409)
	Town Size	0.0710***	0.0541***	0.0540***
		(0.0158)	(0.0160)	(0.0161)
	Education	-0.0530***	-0.0529***	-0.0586***
		(0.00403)	(0.00411)	(0.00418)
	Male	-0.102***	-0.122***	-0.124***
		(0.0330)	(0.0334)	(0.0338)
	Employed in Finance	-0.664***	-0.628***	-0.638***
		(0.0739)	(0.0741)	(0.0752)
	Log Real Income	-1.135***	-1.132***	-1.102***
		(0.0415)	(0.0424)	(0.0427)
	Log Real Wealth	-0.378***	-0.351***	-0.358***
		(0.0138)	(0.0141)	(0.0143)
	Region GDP	-5.44e-05***	-5.93e-05***	-7.33e-05***
		(3.31e-06)	(3.15e-06)	(3.39e-06)
	Constant	8.669***	8.610***	9.367***
		(0.158)	(.161)	(0.1741)
	Observations	49,124	49,124	49,124
	Prob > χ^2	0.000	0.000	0.000

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Similarly, when we take into account the second specification of social capital of birth of the movers in our dataset, again the *Social Capital of Birth* term is statistically significant. The rest of the results are virtually identical to to those in specification (1). These results are maintained when the calendar year fixed effects are introduced to the regression. We would expect the percent of financial assets in securities to be the lowest in 2008, as individuals pulled money out of their securities as the economy crashed or decided to not invest in a weak securities market. Interestingly, all year fixed effects are positive, and mostly significant, except for the 2010 and 2012 variables, which is statistically significant and negative. Additionally, the zero inflate results show that in all years except for 2016, percent allocation to securities is predicted to be less than 2008, during the crash.

III.   Informal Borrowing

Whereas the previous two outcome variables are institutionalized measures of savings and credit, the SHIW asks direct questions on the presence of informal loans in the household from friends and family living outside the household. As mentioned in the data section, we expect informal borrowing to not only differ between high and low social capital households with regards to informal borrowing, but for that difference to be significantly different after the financial crisis. Table 6 displays the results of this hypothesis.

The coefficient on both *Social Capital* and the *SC/Crisis Interaction* term are both statistically significant. Interestingly enough, the coefficient for *Social Capital* is positive, implying that individuals with higher social capital are more likely to possess loans from friends and family. More specifically, moving from the lowest to the highest social capital province is expected to increase the probability that an individual has informal loans by 19.4%, more than 7 times the sample average. The negative

coefficient on the interaction term indicates that this difference was significantly less after the financial crisis. Region GDP seems to have no effect on the financial outcome variable nor does the household head's employment and education history. *Education*, *Income*, *Age*, and *Marriage* are all projected to decrease the incidence of informal borrowing. *Town Size*, as noted in section II, is expected to increase the presence of informal loans as large population centers tend to be poorer overall.

Again, like the previous results, we run the same specification with the *Social Capital of Birth* in order to disentangle any region-level effects that could be accounting for the results. The results are corroborated as both the coefficients for *Social Capital of Birth* and the *SCB/Crisis Interaction* term are both statistically significant. More interestingly, the positive sign on the coefficients again implies that those individuals with higher social capital are expected to possess outstanding loans from friends and family than lower social capital individuals, but this difference is less than before the financial crisis. Quantified, moving from the lowest to the highest social capital province is estimated to increase the probability that an individual has informal loans by 6.59%, more than twice the sample average. Again like specification (1), the experience of working in financial or insurance services is not a significant predictor for the presence of informal borrowing. However, *Log Real Wealth*, which was significant in specification (1) is no longer a significant predictor.

Building on regression (2), specification (3) includes year fixed effects summarized in table A7 in the appendix. *Social Capital of Birth* is no longer statistically significant, suggesting that the previously captured effects have been incorporated by the year fixed effects. Interestingly, almost all year fixed effects, with baseline year 2008, are negative and statistically significant, purporting that the incidence of informal loans was higher in 2008. This is an anticipated result as many families had to turn to the informal credit market as institutional sources failed, froze credit, or were otherwise unavailable. All other control variables maintain the same sign, magnitude and significance in specification (3).

Table 6. Differential Effect of Social Capital on Informal Borrowing

Variables	(1) Social Capital	(2) Social Capital of Birth	(3) Year Fixed Effects
Crisis	0.159***	0.148***	
	(0.0355)	(0.0364)	
Social Capital	0.170***		
	(0.0346)		
SC/Crisis Interaction	-0.158***		
	(0.0393)		
Social Capital of Birth		0.0570*	0.0301
		(0.0335)	(0.0268)
SCB/Crisis Interaction		-0.107***	
		(0.0412)	
Members	0.107***	0.111***	0.108***
	(0.0174)	(0.0186)	(0.0189)
Age	-0.0171***	-0.0178***	-0.0184***
	(0.00146)	(0.00154)	(0.00158)
Married	-0.102**	-0.104**	-0.100**
	(0.0471)	(0.0492)	(0.0498)
Town Size	0.0653***	0.0700***	0.0662***
	(0.0190)	(0.0196)	(0.0199)
Education	-0.00932*	-0.0117**	-0.0126**
	(0.00508)	(0.00533)	(0.00543)
Male	-0.0918**	-0.0984**	-0.0933**
	(0.0380)	(0.0393)	(0.0398)
Employed in Finance	-0.120	-0.0903	-0.0943
	(0.128)	(0.128)	(0.130)
Log Real Income	-0.312***	-0.316***	-0.317***
	(0.0264)	(0.0282)	(0.0287)
Log Real Wealth	0.0173*	0.00766	0.00754
	(0.0102)	(0.0109)	(0.0110)
Region GDP	-5.31e-06	2.71e-06	-4.31e-06
	(3.80e-06)	(3.59e-06)	(3.72e-06)
Constant	-0.959***	-1.034***	-0.548***
	(0.153)	(0.156)	(0.166)
Observations	60,405	57,490	57,490
Number of HH_ID	32,599	30,721	30,721
Pseudo R-Squared	0.357	0.406	0.413
Prob > χ^2	0.000	0.000	0.000

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The result that higher social capital is associated with a higher probability of possessing an informal loan contradicts previous research by Guiso et al. (2004). Banfield (1967) and Fukuyama (1995) also both assert that low-social-capital societies rely more heavily on naturally high-trust relationships such as those with friends and family, implying that the incidence of informal loans is a sign of low social capital. We would argue that high social capital could be accounting for our results as *Social Capital* could play a defining factor in whether others are willing to lend to you or someone with lower social capital. Additionally, a person with high social capital may possess a larger network that facilitates finding a lender much more easily than someone with lower social capital who has a smaller pool of lenders to work with. The significant and negative *SC/Crisis* and *SCB/Crisis Interaction* terms could imply that while higher social capital individuals do have a larger network to receive a loan from, after the crisis, others in this network have less disposable money to loan out than before the crisis, leading to a lower prevalence of informal borrowing after the crisis. Regression (2) again asserts that social capital is associated with a higher frequency of loans with friends in family. However, specification (3) claims that social capital in fact is not a significant predictor of the use of informal credit and neither corroborates or invalidates previous literature. Further research into this instrument is likely necessary as our findings are not conclusive.

Conclusion

Economic investigations often use capital – either measured as income or GDP per capita – as a regressor due to its ubiquity and ability to expose confounding factors. We argue that social capital should also be accounted for, considering it is a productive form of capital with far-reaching implications. Though somewhat recently introduced to economic literature, the idea of this form of capital has been thoroughly developed by seminal figures such as Putnam, Fukuyama, and, latterly,

Guiso et al. It has been shown that social capital, though intangible by nature, can have tangible impacts on financial participation (Guiso et al. 2004), community development (Putnam 1993), intrafirm networks (Tsai et al. 2017), and even mortality (Kawachi et al. 1997). While the impact of social capital endowment on financial participation has been studied before, our paper aims to build on previous literature by examining social capital and financial participation in the context of financial crises. Because of the paradigm shifting nature of financial crises, we would expect them to change alter behavior caused by the "productive nature" of social capital. More specifically, we analyze Italian households before and after the financial crisis of 2007-2009 to determine the mitigating effect of high social capital and utilization of credit cards, investment in securities, and informal borrowing between the pre and post crisis periods.

Taking into account only the coefficients on *Social Capital* and the *Social Capital of Birth*, there is a positive and significant effect on all three outcome variables. Credit card usage and investments in securities as a proportion of wealth are projected to increase with heightened social networks and norms. Informal borrowing, however, was also positively impacted by an individual's social capital, differing from previous findings (Guiso et al., 2004). While initially surprising, this result does have economic validity when put into the context of interpersonal trust and social network systems, especially after a financial crisis. We also find the expected effect of a crisis on these financial outcome variables to increase credit card usage and rates of informal loans but decrease percent allocation of financial assets in securities. The former can be explained by the novel nature of credit cards in Italy as they have recently become popular whereas the latter two are anticipated results.

Our findings indicate mixed results with regards to the differential effects of social capital on financial participation before and after a crisis. The social capital and crisis interaction term is significant in the regressions for credit card ownership and informal borrowing but insignificant when it

comes to predicting the percentage allocation of securities. When social capital of birth is taken into account, the interaction term is only significant for informal borrowing, which is negative, indicating that, while individuals with high social capital do borrow more from friends and family after a crisis, their rate of borrowing is less than that before the financial crisis.

Italy serves as an important case study in the examination of social capital and economic crises, because of both its proximity to the 2008-2009 financial crisis and its use in prior studies on social capital. Though Italy certainly has norms and cultural attributes that are specific to the country, the results of this study can certainly be extrapolated to similarly structured European countries, as well as the US. Our investigation attempts to connect the dots between social capital, personal finance, and economic crises at a time when the next crisis is looming and the landscape of financial instruments is modernizing rapidly. There are implications from this study that may inform policy decisions, such as easing loan requirements or improving financial education in regions or counties with lower social capital, especially following an economic crisis. Future directions of study could include new countries, novel financial instruments – for example, bitcoin or mobile payments – or a greater focus on creating a comprehensive social capital index.

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Appendix

Table A1. Control Variable Descriptions

Source	Variable Name	Variable Description
SHIW	*HH_ID*	Unique identification number for each household. Used as the panel ID and keeps track of households surveyed over multiple years.
SHIW	*HH_Age*	Age of the household head
SHIW	*HH_Education*	Years of education of the household head. No education (0 years), primary school (5 years), lower secondary school (8 years), vocational study (11 years), high school (13 years), 3-year or 5-year university degree (16 or 18 years), graduated education (20 years)
SHIW	*HH_FinEmp*	Indicator variable equal to 1 if the household head has ever been employed in the financial sector or insurance industry
SHIW	*HH_Male*	Indicator variable equal to 1 if the household head is male
SHIW	*HH_Married*	Indicator variable equal to 1 if the household head is married
SHIW	*HH_Members*	Number of people living in the household at the time of survey
SHIW	*HH_LnRealIncome*	Natural log of the net income reported by the household head in terms of thousands of 2018 euros
SHIW	*HH_LnRealWealth*	Natural log of the net wealth reported by the household head in terms of thousands of 2018 euros
SHIW	*HH_TownSize*	Categorical variable indicating size of the town of household residence. It is coded as 0 (0-20,000 inhabitants), 1 (20,000-40,000 inhabitants), 2 (40,000-500,000 inhabitants), or 3 (more than 500,000 inhabitants)
i.Stat	*Reg_GDP*	Average GDP per capita for the region

Table A2. Social Capital Proxy Variable Descriptions

Source	Variable Name	Variable Description
i.Stat	*social_activity_cultural*	Persons aged 14 years and over who met in cultural associations, recreational or other in the past 12 months (per 100 people). The data are available from 2002 to 2014, not including 2004.
i.Stat	*social_activity_volunteering*	Persons aged 14 years and over who met in voluntary associations in the past 12 months (per 100 people). The data are available from 2002 to 2014, not including 2004.
i.Stat	*reading_newspapers*	Persons aged 6 years and over reading newspapers at least five times over a week (per 100 people). The data are available from 2002 to 2014, not including 2004.
i.Stat	*political_information*	Persons aged 14 and over who inform themselves about Italian politics everyday (per 100 people). The data are available from 2002 to 2014, not including 2004.
i.Stat	*political_activities*	Persons aged 14 and over who listened to a political debate (per 100 people). The data are available from 2002 to 2014, not including 2004.
i.Stat	*meeting_friends*	Persons aged 6 and over who met with friends everyday (per 100 people). The data are available from 2002 to 2014, not including 2004.
i.Stat	*religious_observance*	Persons aged 6 and over by frequency to place of worship in the last 12 months (per 100 people)
i.Stat	*posting_opinions*	Individuals aged 6 and over who accessed the internet in the last 3 months to post opinions on civic or political issues (per 100 people). The data are available from 2011 to 2014.
i.Stat	*social_networks*	Individuals aged 6 and over who accessed the internet in the last 3 months to participate in social networks (per 100 people). The data are available from 2011 to 2014. The data show an upwards trend over time, likely a result of heightened internet usage.
OECD	*corruption_perception*	Persons aged 14 and over that perceive corruption in their country's institutions (per 100 people). The data are only available in 2014.
OECD	*social_network_perception*	Persons aged 14 and over that perceive their social network to be strong (per 100 people). The data are only available in 2014.
Ministry of Interior	*voter_turnout*	Calculated by region as the number ballots cast divided by the region's voting-age population averaged for 2006 and 2013 elections

Table A3. Social Capital Proxy Averages by Region

Region	SC Index	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Abruzzo	-0.005	18.98	8.16	31.46	34.18	32.49	26.49	6.71	25.79	20.30	56.38	78.40	91.70	93.30
Basilicata	-1.363	18.21	8.31	25.86	27.92	33.71	35.33	8.05	23.39	23.50	57.96	74.30	90.50	85.90
Calabria	-0.947	17.09	6.44	25.11	27.67	36.19	31.47	5.95	21.91	22.52	57.62	68.50	85.00	85.60
Campania	-0.777	17.70	5.02	22.78	28.63	40.37	28.09	5.13	19.35	22.12	60.90	73.10	85.80	83.80
Emilia-Romagna	0.539	22.45	9.99	43.58	44.54	23.01	18.20	11.25	24.71	19.02	52.50	85.00	87.50	86.90
Friuli-Venezia Giulia	0.989	24.80	13.50	41.75	47.90	23.68	18.40	12.24	22.12	17.96	49.44	79.10	92.80	91.10
Lazio	-0.599	24.04	7.66	36.77	40.28	26.77	19.02	6.77	22.48	21.70	58.50	79.60	92.40	88.20
Liguria	0.674	25.54	7.99	39.83	44.11	22.59	21.03	8.45	21.40	18.70	48.30	78.00	94.50	83.20
Lombardia	1.141	22.70	9.89	37.64	40.75	34.12	19.10	12.44	22.03	17.60	50.68	83.10	88.10	85.60
Marche	0.377	19.74	9.32	35.23	36.61	36.38	21.36	9.32	22.84	19.40	55.96	81.90	87.00	86.70
Molise	-1.193	17.06	8.28	29.09	29.29	36.81	31.71	6.52	21.48	23.10	58.60	75.70	80.40	75.60
Piemonte	0.963	22.20	9.99	37.04	36.82	28.65	16.64	10.55	21.44	18.02	50.36	80.40	92.90	86.00
Puglia	-0.556	15.86	6.68	24.84	30.21	39.87	30.03	6.15	20.23	21.60	58.64	74.60	85.20	88.10
Sardegna	-1.388	21.04	9.55	39.24	47.58	27.03	26.37	8.99	25.91	23.56	58.08	72.50	92.50	85.80
Sicilia	0.114	14.06	6.36	25.36	33.14	38.61	27.21	5.56	17.89	20.02	60.16	69.60	86.30	87.10
Toscana	-0.523	22.09	8.91	42.39	41.44	21.11	21.81	10.09	22.95	21.52	56.12	82.70	93.20	89.70
Trentino Alto Adige	1.515	33.50	23.07	33.66	49.69	33.19	20.79	21.51	24.58	16.72	46.42	82.60	90.10	86.30
Umbria	-1.397	19.86	9.75	39.14	36.77	26.82	24.49	8.97	23.83	23.58	57.44	82.50	81.10	80.00
Valle d'Aosta	1.337	28.43	10.96	33.74	39.21	22.50	21.41	12.13	19.90	17.14	48.22	78.60	81.00	75.00
Veneto	1.099	21.30	12.60	40.17	37.07	35.44	16.32	14.21	22.46	17.70	49.56	83.50	88.90	80.00

1 - Interpersonal Trust   2 - Cultural Associations   3 - Political Information
4 - Reading Newspapers   5 - Religious Observance   6 - Meeting Friends
7 - Voluntary Associations   8 - Political Activities   9 - Social Networks
10 - Posting Opinions   11 - Voter Turnout   12 - Social Network Perception
13 - Corruption Perceptions

Table A4. Summary Statistics by Region

Region	SC Index	Region ID	Observations	Education	Real Income	Town Size	Age	Informal Loans	Credit Cards	Securities
Abruzzo	-0.005	13	1,671	10.13	34.31	1.32	57.93	0.015	0.229	0.105
Basilicata	-1.363	17	961	7.71	26.56	0.64	60.31	0.035	0.206	0.045
Calabria	-0.947	18	1,616	8.28	24.53	1.03	61.89	0.023	0.188	0.024
Campania	-0.777	15	5,452	8.17	24.39	1.75	58.12	0.059	0.136	0.031
Emilia-Romagna	0.539	8	5,446	10.13	42.34	1.27	57.09	0.020	0.434	0.332
Friuli	0.989	6	1,792	10.33	42.96	0.70	58.57	0.011	0.417	0.227
Lazio	-0.599	12	3,478	9.84	35.19	1.88	57.92	0.016	0.284	0.084
Liguria	0.674	7	2,632	10.27	38.18	1.57	59.48	0.020	0.365	0.218
Lombardia	1.141	3	6,933	10.27	43.91	1.47	58.31	0.022	0.466	0.243
Marcha	0.377	11	2,974	9.07	39.03	1.09	61.26	0.010	0.305	0.196
Molise	-1.193	14	854	9.31	32.80	0.84	60.25	0.006	0.201	0.034
Piemonte	0.963	1	5,784	8.83	33.66	1.31	59.88	0.037	0.293	0.201
Puglia	-0.556	16	3,590	8.18	27.38	1.54	57.58	0.028	0.166	0.045
Sardegna	-1.388	20	2,646	8.15	30.51	0.89	59.96	0.017	0.141	0.064
Sicilia	0.114	19	4,678	8.59	25.96	1.99	58.22	0.034	0.206	0.065
Toscana	-0.523	9	4,816	9.80	42.46	1.51	60.39	0.018	0.381	0.229
Trentino	1.515	4	1,432	10.03	39.06	0.58	57.66	0.013	0.249	0.133
Umbria	-1.397	10	2,146	8.89	36.57	0.71	59.26	0.013	0.289	0.186
Valle d'Aosta	1.337	2	321	8.52	32.58	0.54	57.55	0.040	0.344	0.165
Veneto	1.099	5	4,295	9.35	38.19	0.96	57.24	0.022	0.294	0.232

Table A5. Credit Card Regression Results

Variables	(3) Year Fixed Effects
y02	-0.452***
	(0.0434)
y04	-0.244***
	(0.0390)
y06	-0.0373
	(0.0360)
y10	0.135***
	(0.0353)
y12	0.0903**
	(0.0362)
y14	0.128***
	(0.0374)
y16	0.267***
	(0.0387)
Constant	-4.023***
	(0.186)
Observations	54,882
Number of HH_ID	29,364

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A6. Securities Regression Results

Variables	(3) Year Fixed Effects
y02	0.0370***
	(0.00535)
y04	0.0203***
	(0.00487)
y06	0.00324
	(0.00458)
y10	0.0136***
	(0.00455)
y12	0.000168
	(0.00464)
y14	0.00317
	(0.00474)
y16	-0.0183***
	(0.00490)
Constant	-0.294***
	(0.0226)
Observations	49,124
Number of HH_ID	26,872

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A7. Informal Borrowing Regression Results

Variables	(3) Year Fixed Effects
y02	-0.771***
	(0.0878)
y04	-0.431***
	(0.0722)
y06	-0.188***
	(0.0648)
y10	-0.0356
	(0.0611)
y12	-0.152**
	(0.0643)
y14	-0.144**
	(0.0652)
y16	-0.126*
	(0.0680)
Constant	-0.0196
	(0.287)
Observations	57,490
Number of HH_ID	30,721

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1