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Macroeconomic Conditions and Well-being: Do Social Interactions Matter?

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Abstract

This paper investigates the role played by social interactions as moderators and mediators of the effects of macroeconomic conditions on well-being. Using survey data for a representative sample of Italian individuals, we find that social interactions play a dual role. On the one hand, the well-being of people who spend more time with their friends or go out more often is less sensitive to the effects of macroeconomic fluctuations. On the other hand, social interactions are negatively affected by worsening macroeconomic conditions, thus playing a relevant role in the transmission of macroeconomic shocks to subjective well-being. More specifically, the negative impact of downturns on frequency of going out and active participation in associations significantly contributes to the adverse effects of recessions on satisfaction with life and with individual life domains.

SER Keywords: unemployment, social interactions, well-being.
JEL codes: E32, I31, I38

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1 Introduction

Since the seminal work by Di Tella et al. (2003), it has been widely documented that macroeconomic conditions matter for subjective well-being (Deaton, 2012; Mohseni-Cheraghlou, 2013; Helliwell and Huang, 2014; Cahill et al., 2015; Blanchflower et al., 2014; Frijters et al., 2015; Hariri et al., 2015; Ratcliffe and Taylor, 2015; Mertens and Beblo, 2016).[1] What is less clearly understood is the underlying transmission mechanism. The standard view is that macroeconomic fluctuations generate income and wealth shocks at individual level, which, in turn, impact on consumption patterns and, ultimately, on well-being (Stanca and Veenhoven, 2015). In addition, negative macroeconomic performance produces economic stress, which changes the subjective perception of individual economic prospects and enhances the fear of not being able to cope with financial obligations (Hagan et al., 1982).

This paper studies the role played by social interactions in moderating and mediating the effect of macroeconomic fluctuations on well-being, a relatively unexplored channel of the transmission mechanism. More specifically, we focus on social interactions in their specific role as consumption goods (i.e., relational goods). It is well known that social interactions play a significant role for individual well-being (Diwan, 2000; Aslam and Corrado, 2007; Becchetti et al., 2008; Bruni and Stanca, 2008; Bartolini and Bilancini, 2010; Gui and Stanca, 2010; Becchetti et al., 2011; Van der Horst and Coffé, 2012; Böckerman et al., 2016). At the same time, social interactions do have a cost, either direct or indirect, and can therefore be affected by the state of the economy. More specifically, worsening economic conditions can be expected to adversely affect the consumption of social interactions through a standard income effect. On the other hand, during downturns the opportunity cost of time-intensive activities is reduced (Ruhm, 2000). This may positively affect the demand for and consumption of time-intensive goods, such as social interactions and, in particular, interactions with family and friends.

Social interactions may therefore act as a positive or negative mediator of the effect of aggregate fluctuations on well-being, with the direction of the effect being, *a priori*, ambiguous. To the extent that their consumption is procycical (anticyclical), social interactions can be expected to enhance (offset) the effecs of macroeconomic conditions on well-being. In addition, social interactions may provide support (Wills, 1991), solidarity, a sense of belonging (Becchetti et al., 2008), positive psychological states (Uchino et al., 1999) and positive emotions (Bradburn, 1969), that can contribute to moderate the effects of macroeconomic fluctuations on subjective well-being (Gore, 1978; Berkman and Glass, 2000; Reeskens and van Oorschot, 2014): the well-being of individuals who enjoy higher levels of social interactions can be expected, ceteris paribus, to be less sensitive to the effects of macroeconomic fluctuations.

[1] More recently, a number of authors have focused on the effects of the current economic and financial crisis in terms of subjective well-being (Deaton, 2012; Hoynes et al., 2012; McInerney et al., 2013; Helliwell and Huang, 2014; Hariri et al., 2015; Chadi, 2015).

In this paper, we aim at assessing the mediating and moderating role played by social interactions for the effects of macroeconomic conditions on well-being within a simple framework. Our empirical analysis exploits a large and representative sample of Italian individuals between 1993 and 2012. We focus on three domains of social interactions: time spent with friends, frequency of going out for leisure activities, and active participation in associations. Our findings indicate that social interactions play a dual role as both mediators and moderators. On the one hand, the adverse effect of province-level unemployment on life satisfaction is less strong for those who go out more often, and the negative effects on satisfaction with life domains are less strong for those who spend more time with their friends or go out more often. On the other hand, frequency of going out plays a significant role as a positive mediator of the effect of province-level unemployment on satisfaction with life and with individual life domains. Participation in associations also acts as a significant mediator of the effect of the local unemployment rate on satisfaction with family, friends and leisure.

The remainder of the paper is structured as follows. Section 2 briefly discusses the related literature. Sections 3 and 4 describe the data and methods, respectively. Section 5 presents the results. Section 6 concludes.

2 Related literature

The costs of recessions are widely acknowledged to be much larger, overall, than the purely economic costs measured in terms of income loss. They include, for example, loss of human capital, as lower disposable income reduces school enrolment rates, particularly in countries where the economic cost of education is substantial (Dellas and Koubi, 2003); adverse health effects, as economic uncertainty triggers stress-related diseases (Stuckler et al., 2009); higher crime rates (Gould et al., 2002). Recessions may also have an impact on family decision making: economic uncertainty and negative income shocks may discourage long term commitments such as marriage; they may also decrease the probability of costly decisions such as asking for a divorce. As a consequence, both marriage and divorce rates tend to be pro-cyclical (Schaller, 2013; Hellerstein et al., 2013; González-Val and Marcén, 2015). More generally, during economic downturns individuals can change their time allocation in favor of leisure activities (Aguiar et al., 2013) and home production (Burda and Hamermesh, 2010). All these factors can be expected to affect individuals' well-being.

The recent economic crisis provides a sort of magnifying glass through which these effects can be observed. Deaton (2012) and Cahill et al. (2015) show that in the United States the financial crisis has significantly reduced job satisfaction and life satisfaction, while sharply increasing stress. Helliwell and Huang (2014) document significant costs associated with worsening labor market conditions. For those who are unemployed, the impact on well-being from an increase in the un-

employment rate is much larger than that deriving from lower income. However, even for those who are employed, a 1% decrease in the local unemployment rate has a similar impact on well-being to a 4% fall in income. Mertens and Beblo (2016) show that during the economic crisis individuals in the UK and Germany reported lower satisfaction with life, employment and health. Recessions matter for society as a whole, so that focusing only on the economic dimension would lead to underestimate their effects.

Our analysis focuses on social interactions, an important source of social support (Wills, 1991) and, as a consequence, a key determinant of well-being. The relationship between social support and well-being can be explained through a two-fold mechanism, direct and indirect. The direct mechanism points to a positive influence of social support on mental and physical health, which, in turn, affects well-being. There is considerable evidence of this mechanism in the medical and psychological literature. Tomioka et al. (2016) show that participation in social activities improves older adults' ability to perform the activities of daily living, significantly improving quality of life. Cole et al. (2015) find that perceived social isolation is linked to an increase in the stress hormone cortisol, high blood pressure and inflammation in the body, while it can diminish executive function, learning, and memory. Cacioppo and Cacioppo (2014) find that loneliness can impair executive functioning, sleep, and mental and physical well-being, contributing to higher rates of morbidity and mortality in lonely older adults. Finally Luo et al. (2012) show that chronic perception of social isolation increases a person's chance of premature death by 14 per cent. The impact of perceived loneliness on premature death is almost as strong as the impact of living in poverty and far stronger than the impact of obesity. In psychology, Baumeister and Leary (1995), Ryan and Deci (2001), and Kahneman et al. (2004) find a strong positive link between social interactions and happiness.

The indirect mechanism, instead, considers social support within a broader framework, whereby the negative effect of stressful situations on well-being can be mitigated by the availability of external resources, i.e., social support, and the availability of internal resources, such as coping strategies and personality traits (Bovier et al., 2004; Barrera et al., 2006). More generally, social interactions generate a sense of belonging to a group or a community, which is often associated to positive emotional states (Davidson et al., 1991) and individual well-being (Cicognani et al., 2008). As a result, social interactions may act as shock absorbers, dampening the deleterious effects of adverse economic shocks on well-being. Economic downturns can affect the consumption of time-intensive goods (Ruhm, 2000), such as social interactions and, through this channel, individual well-being.

In this paper we focus on social interactions in their role as relational goods. Uhlaner (1989) and Gui (1987) define relational goods as goods that "can only be possessed by mutual agreement that exist, after appropriate joint actions taken by a person and non-arbitrary others"(1989, p. 254). Relational goods are, therefore, local-public and anti-rival goods, since they cannot be enjoyed by an isolated in-

dividual, but, rather, they can be consumed only when shared with others (Bruni and Stanca, 2008). As such, they produce positive externalities. The most important producers of these goods are family and friends. On a larger scale, they can also be produced by social events, such as concerts and sport events (Becchetti et al., 2008), or by actively engaging in volunteering associations.

A number of studies have found a positive link between the consumption of relational goods and well-being. Based on a large sample of individuals from the World Values Survey, Bruni and Stanca (2008) found that the relational component of volunteering is positively and significantly associated with higher life satisfaction, with the size of the effect being equivalent to moving up by one decile in the income scale (see also Becchetti et al. (2011) for a closely related study). Time spent with parents and relatives, or friends and people at volunteering organizations, has a positive effect on life satisfaction. Becchetti et al. (2008) investigated the impact of sociality on individual well-being, testing the hypothesis that people with a more intense relational life are happier. Their findings indicate that relational activities have significant and positive effects on self-reported life satisfaction, even when reverse causality is explicitly taken into account. Stanca (2009) used implicit valuations estimated from life satisfaction equations to measure quality of relational life and compare it across countries throughout the world, finding that better macroeconomic conditions are associated with a higher quality of relational life.

3 Data

Our empirical analysis is based on individual-level data from the "Multipurpose survey on households: aspects of daily life"(ISTAT, 2015), which has been conducted on an annual basis since 1993 by the Italian Statistical Office through face-to-face interviews on a rotating sample of about 24,000 households (50,000 individuals) per year. This survey provides information on several aspects of daily life, including individual and household characteristics, work, family and social life, time use, political and social participation, health, lifestyle, satisfaction with life and with individual life domains. We consider all annual waves from 1993 to 2012 (in 2004 the survey was not conducted).

Following Colombo and Stanca (2014), social interactions are measured by focusing on three domains: time spent with friends, frequency of going out for leisure activities, and active participation in associations. Table 1 presents descriptive statistics for indicators of social interactions at individual level.

[TABLE 1]

Time spent with friends is measured on the basis of the following question: "How often in your free time do you meet with friends? (never, few times per year,

less than 4 times per month, once a week, more than once a week, every day)". We construct a binary indicator that takes value 1 for individuals who report to meet with friends at least once a week. Social interactions through recreational activities are measured by aggregating 7 variables that measure the frequency of participation in the following leisure activities: theater, cinema, museums, opera, concerts, sport events, dance.[2] We construct the overall indicator at individual level as a dummy variable that is equal to one if any of the 7 variables is greater than or equal to 3. The resulting indicator therefore identifies individuals who go out more frequently (at least 4-6 times per year) in at least one of the recreational activities being considered. Social interactions through social involvement are measured by focusing on active participation in four types of associations: volunteering, non-volunteering, parties and trade unions. For each type of association, a dummy variable indicates whether the individual has participated actively during the previous 12 months. We construct the individual-level indicator as a dummy variable equal to one if the individual has participated actively in at least one type of association.[3]

Table 2 provides summary statistics for the key variables used in the empirical analysis. Life satisfaction, available only since 2010, is measured on a scale between 0 and 10. Satisfaction with life domains (health, family, friends, leisure, work, economic conditions), available for all years, is measured as a categorical variable with four possible ordered categories: very much, enough, not much, not at all.[4] We restrict the sample to individuals between the age of 18 and 66, and further exclude from the analysis individuals who retired or are unable to work. This yields a final sample size of about 620,000 individuals, overall.

[TABLE 2]

Local economic conditions are measured by province-level unemployment rate, from the *Territorial Accounts* by ISTAT. Since the Italian geographical disaggregation at NUTS-3 level has changed during the period considered, we reclassified provinces to 103 in order to have geographical units that are consistent throughout the period considered and compatible with those contained in the individual-level survey described above.

[2]Each variable takes values from 1 to 5 corresponding to the following categories: never, 1-3 times per year, 4-6 times per year, 7-12 times per year, more than 12 times per year.

[3]It should be noted that this variable refers to active participation, as opposed to mere membership, and is therefore intended to capture the relational dimension of social interactions, rather than the network dimension (Bruni and Stanca, 2008).

[4]Satisfaction with the environment was not considered in the analysis since it is only available since 2003.

4 Methods

Figure 1 illustrates the transmission mechanism that we investigate empirically. We assume that local economic conditions affect subjective well-being (SWB) both directly (as captured by the parameter γ) and indirectly, through their effect on social interactions, as captured by the parameters α_j and δ_j.

[FIGURE 1]

In our empirical specification, subjective well-being at individual level is modelled as a function of the province-level unemployment rate, indicators of social interactions and a set of individual-level controls, in addition to province and year fixed effects:

$$WB_{ipt} = \beta + \gamma U_{pt} + \sum_j \delta_j SI_{j,ipt} + X_{ipt}\Pi + \mu_p + \lambda_t + \varepsilon_{ipt} \quad (1)$$

where WB_{ipt} denotes subjective well-being of individual i in province p at time t, which is measured by satisfaction with life or satisfaction with individual life domains, U_{pt} is the unemployment rate in province p at time t, $SI_{j,ipt}$ represents individual indicators of social interactions, as described in Section 3, X is a vector of individual-level controls (marital status, education, age, gender, etc.), with coefficients denoted by Π. μ_p and λ_t denote province and time (year) fixed effects, while ε_{ipt} is the individual-level error term.

Given the cross-sectional nature of the data set, it should be observed that estimates for γ could reflect unobserved heterogeneity, since unobserved factors might co-determine both subjective well-being and macroeconomic conditions. While reverse causality is unlikely, given that subjective well-being at individual level should not be expected to determine macroeconomic fluctuations, the issue of unobserved heterogeneity is more relevant. In the absence of longitudinal data, or appropriate instrumental variables, we consider specifications that include province-level fixed effects to control for any unobservable time-invariant province-specific effect (e.g., differences in lifestyle across provinces) and year fixed effects to capture unobserved aggregate time effects or time trends. Estimates for δ_j could also be biased since social interactions are not exogenous with respect to well-being. One possible source of omitted variable bias, could be income. Since we do not have a direct measure of income, we include among the controls education level, occupation status and type of occupation. For ease of interpretation, we present Ordinary Least Square (OLS) estimates for equation (1). In order to assess the robustness of the results, we also present Ordered Logit estimates, thus taking into account the ordinal nature of the dependent variables. Standard errors, robust to heteroskedasticity, are clustered at the province level.

The moderating role played by social interactions is assessed by estimating the specification in (1) while also allowing for an interaction between each indicator of social interactions and local unemployment, as described below:

$$WB_{ipt} = \beta + \gamma U_{pt} + \sum_j \delta_j SI_{j,ipt} + \sum_j \theta_j (U_{pt} * SI_{j,ipt}) + X_{ipt}\Pi + \mu_p + \lambda_t + \varepsilon_{ipt} \quad (2)$$

In order to estimate the mediating effect of social interactions for the relationship between macroeconomic conditions and subjective well-being, we follow the approach proposed by Preacher and Hayes (2008). We use Seemingly Unrelated Regression (SUR) to estimate the effect of local economic conditions on social interactions (α_j) and the effect of social interactions on subjective well-being (δ_j). The indirect effect of local economic conditions on SWB via mediator j is then obtained as the product of the two coefficients ($\alpha_j \delta_j$). The total indirect effect of economic conditions on subjective well-being through social interactions is obtained as $\sum_j \alpha_j \delta_j$, and the overall effect as the sum of the direct and indirect effects (i.e., $\gamma + \sum_j \alpha_j \delta_j$).

5 Results

We start by characterizing the relationship between aggregate economic conditions and subjective well-being. We then focus on the role played by social interactions as moderating and mediating factors, respectively.

5.1 Local unemployment and subjective well-being

Table 3 presents OLS estimates for equation (1), using either life satisfaction or satisfaction with individual life domains as a dependent variable. Each column reports, for a given well-being indicator, the estimated coefficient for the province-level unemployment rate and the individual-level indicators of social interactions. Province-level unemployment is negatively and significantly related to life satisfaction: a one-percentage point increase in the province-level unemployment rate is associated to a 0.04 drop in life satisfaction, on a scale between 0 and 10. All indicators of social interactions are positively and significantly related to life satisfaction. The size of the coeffcients is also relevant. Ceteris paribus, individuals with higher levels of time spent with friends, frequency of going out, or active participation in associations, report higher life satisfaction by 0.19, 0.18 and 0.11 points, respectively. In short, while province-level unemployment is negatively related to life satisfaction, higher levels of social interactions are positively related to life satisfaction.

[TABLE 3]

Focusing on satisfaction with individual life domains, province-level unemployment is negatively and significantly related to satisfaction with health, friends and economic conditions. It is also negatively related, although not significantly, with all other life domains. With only one exception (the relationship between active participation in associations and satisfaction with health) all indicators of social interactions are positively and significantly related to satisfaction with each life domain. To sum up, while local unemployment is negatively related to satisfaction with individual life domains, indicators of social interactions display a consistent pattern of a positive and significant relationship.

Table 4 presents estimation results obtained by using an ordered logit estimator, in order to take into account the ordinal nature of the dependent variable in equation (1). There are no qualitative differences with respect to the OLS estimates reported in Table 3. The unemployment rate is negatively related to satisfaction with life overall and, among life domains, to satisfaction with health, friends and economic conditions. All indicators of social interactions are positively and significantly related to satisfaction with life and with each life domain. Given the robustness of the results, and for ease of the interpretation of the coefficients, in the following we will focus on OLS estimates.

[TABLE 4]

5.2 The moderating role of social interactions

Table 5 presents estimation results for equation (2), reporting only the coefficients for the interaction term between province-level unemployment and each of the three indicators of social interactions. The results in column (1) indicate that the negative effect of province-level unemployment on life satisfaction is significantly les strong for individuals who enjoy a higher frequency of going out for leisure activities. The interaction terms for time spent with friends and active participation in associations are instead relatively small and not statistically significant.

[TABLE 5]

Focusing on satisfaction with individual life domains, both time spent with friends and frequency of going out play a significant moderating role for the effects of province-level unemployment. The interaction term between time spent with friends and province-level unemployment rate is positive and significant for satisfaction

with health, family and friends. It is instead negative and significant for satisfaction with economic conditions. The interaction term between frequency of going out and province-level unemployment is positive and significant for satisfaction with health, family, friends, work and economic conditions. Overall, the findings indicate that the negative effect of local unemployment on satisfaction with individual life domains is less strong for individuals who spend more time with their friends or go out more often for leisure activities.

5.3 The mediating role of social interactions

We now turn to the estimation of the indirect effects of province-level unemployment on well-being, as described in Figure 1. We start by assessing the potential role of social interactions as mediators of the relationship between local unemployment and well-being. Table 6 reports estimation results for the relationship between each indicator of social interactions and province-level unemployment, controlling for individual characteristics, time and province fixed effects. Higher province-level unemployment rates are associated to a significantly lower frequency of going out and participation in associations. In the equation for time spent with friends, the coefficient for unemployment is negative but not significant. Overall, the results indicate that worsening macroeconomic conditions negatively affect the consumption of social interactions.

[TABLE 6]

Next, we estimate the indirect effects of local economic conditions on well-being through social interactions, as illustrated in Figure 1. Table 7 reports the results. Each cell presents the indirect effect of province-level unemployment on the indicator of subjective well-being indicated in the column heading, through each of the three mediators (indicators of social interactions) reported in the row heading. Interestingly, the indirect effect of unemployment through frequency of going out is negative and significant for life satisfaction and for satisfaction with all individual life domains. Local unemployment also has a negative and significant indirect effect through participation in associations on satisfaction with family, friends and leisure. No significant indirect effect is found, instead, through time spent with friends.

[TABLE 7]

Table 8 reports the total indirect effect of local unemployment on subjective well-being, i.e. the sum of the indirect effects through each mediator ($\sum_{j=1}^{3} \alpha_j \delta_j$ in

Figure 1) and, for a comparison, the corresponding direct effect (γ in Figure 1). As expected, the total indirect effect, reported in the first row, is generally substantially smaller than the direct effect, reported in the second row. The total indirect effect is negative for life satisfaction and for each life domain. It is also statistically significant for satisfaction with health (-0.017), family (-0.011) and economic conditions (-0.023).

[TABLE 8]

6 Conclusions

We investigated empirically the role played by social interactions for the relationship between macroeconomic conditions and subjective well-being. Overall, the results indicate that social interactions play a dual role as both moderators and mediators of this relationship. On the one hand, people who experience higher levels of social interactions are found to be less sensitive, in terms of well-being, to the effects of macroeconomic fluctuations. More specifically, the adverse effect of economic downturns on subjective well-being are found to be lower for those who spend more time with their friends or go out for leisure activities more often, reflecting the relevant role played by social support and solidarity. On the other hand, social interactions are themselves negatively affected by worsening macroeconomic fluctuations, thus representing a relevant factor for the transmission of macroeconomic shocks to subjective well-being. Frequency of going out for leisure activities is found to play a significant role in transmitting the adverse effects of local unemployment on satisfaction with life and with individual life domains. Active participation in associations is also found to play a significant mediating role for the adverse effects of local unemployment on satisfaction with family, friends and leisure.

This paper suggests that social interactions play a relevant role in the transmission of macroeconomic shocks to individual well-being. Social interactions can mobilize human and material resources that can provide support and protection during economic downturns, therefore affecting *individual* well-being. At the same time, they can significantly contribute to *collective* well-being, by making up for the shortcomings of the welfare state in times of crisis. Social interactions can therefore be viewed as shock absorbers, that may dampen the deleterious effects of economic shocks on well-being. However, since macroeconomic conditions affect the consumption of relational goods, social interactions also contribute to transmit the negative effects of adverse macroeconomic shocks.

Overall, our findings indicate that, in order to be successful, macroeconomic policies need to be complemented by measures aimed at avoiding the adverse effects of macroeconomic conditions on the relational life of individuals. This paper opens up the way for further studies in this direction.

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Table 1: Descriptive statistics, indicators of social interactions

Variable	Mean	Std. Dev.	Min.	Max.	N
Time spent with friends					
Never	0.04	0.20	0	1	624606
Yearly	0.06	0.24	0	1	624606
Monthly	0.17	0.38	0	1	624606
Weekly	0.23	0.42	0	1	624606
More than weekly	0.30	0.46	0	1	624606
Daily	0.20	0.40	0	1	624606
Frequency of going out					
Theater	1.25	0.60	1	5	612213
Cinema	1.90	1.14	1	5	614088
Museum	1.39	0.72	1	5	610678
Opera	1.14	0.48	1	5	610917
Concert	1.29	0.62	1	5	610314
Sport	1.57	1.06	1	5	611111
Disco	1.61	1.14	1	5	612729
Active part. in associations					
No participation	0.88	0.33	0	1	606570
Volunteering	0.09	0.29	0	1	606570
Non-volunteering	0.02	0.15	0	1	606570
Party	0.00	0.06	0	1	606570
Trade union	0.00	0.03	0	1	606570

Source: "Multipurpose survey on households: aspects of daily life" (ISTAT, 2015)

Table 2: Descriptive statistics, individual level

Variable	Mean	Std. Dev.	Min.	Max.	N
Satisfaction with health	3.06	0.63	1	4	607112
Satisfaction with family	3.31	0.61	1	4	606620
Satisfaction with friends	3.12	0.66	1	4	606488
Satisfaction with leisure	2.68	0.78	1	4	606135
Satisfaction with work	2.88	0.71	1	4	462872
Satisfaction with econ. c.	2.45	0.74	1	4	607438
Life satisfaction	7.14	1.64	0	10	80638
Time spent with friends	0.5	0.5	0	1	616729
Frequency of going out	0.39	0.49	0	1	593321
Participation associations	0.12	0.33	0	1	598882
Unemployment rate	0.1	0.07	0.01	0.33	620256
Gender (male)	0.49	0.5	0	1	620256
Age	42.13	12.79	18	66	620256
Age squared	1938.52	1096.92	324	4356	620256
Work: Employed	0.6	0.49	0	1	620256
Work: Student	0.16	0.36	0	1	620256
Work: Housewife	0.04	0.21	0	1	620256
Married	0.64	0.48	0	1	620256
Divorced	0.02	0.13	0	1	620256
Widowed	0.03	0.17	0	1	620256
Number of children	0.96	1.02	0	10	620256
Upper education	0.37	0.48	0	1	620256
Lower education	0.17	0.37	0	1	620256
Executive	0.04	0.2	0	1	614976
Clerk	0.2	0.4	0	1	614976
Worker	0.21	0.4	0	1	614976
Self-employed (high)	0.05	0.22	0	1	614976
Self-employed (low)	0.11	0.31	0	1	614976

Source: "Multipurpose survey on households: aspects of daily life" (ISTAT, 2015)

Table 3: Unemployment, social interactions and well-being (OLS)

	(1) Life	(2) Health	(3) Family	(4) Friends	(5) Leisure	(6) Work	(7) Econ.
Unemp. rate	-3.990**	-0.188*	-0.040	-0.255**	-0.009	-0.030	-0.519**
	(1.001)	(0.085)	(0.077)	(0.093)	(0.128)	(0.216)	(0.104)
Time friends	0.185**	0.052**	0.036**	0.263**	0.231**	0.048**	0.056**
	(0.016)	(0.003)	(0.004)	(0.005)	(0.004)	(0.003)	(0.004)
Time out	0.177**	0.074**	0.036**	0.103**	0.130**	0.034**	0.095**
	(0.017)	(0.002)	(0.003)	(0.003)	(0.004)	(0.003)	(0.005)
Associations	0.111**	0.006	0.033**	0.058**	0.047**	0.013**	0.017**
	(0.021)	(0.003)	(0.003)	(0.004)	(0.005)	(0.005)	(0.005)
N.	77343	574209	573853	573766	573491	441651	574464
R^2	0.09	0.10	0.04	0.09	0.10	0.07	0.13

Note: OLS estimates. Robust standard errors clustered at province level reported in brackets. Individual characteristics, time and province fixed effects, as described in equation (1), included but not reported. * and ** denote statistical significance at 0.05 and 0.01 level, respectively.

Table 4: Unemployment, social interactions and well-being (ordered logit)

	(1) Life	(2) Health	(3) Family	(4) Friends	(5) Leisure	(6) Work	(7) Econ.
Unemp. rate	-4.672**	-0.629*	-0.102	-0.768**	-0.072	-0.114	-1.700**
	(1.346)	(0.298)	(0.263)	(0.291)	(0.323)	(0.567)	(0.279)
Time friends	0.203**	0.176**	0.108**	0.802**	0.590**	0.137**	0.157**
	(0.020)	(0.010)	(0.012)	(0.016)	(0.011)	(0.009)	(0.011)
Time out	0.182**	0.253**	0.111**	0.312**	0.326**	0.095**	0.269**
	(0.021)	(0.009)	(0.011)	(0.010)	(0.009)	(0.010)	(0.014)
Associations	0.120**	0.029*	0.125**	0.188**	0.121**	0.052**	0.053**
	(0.025)	(0.013)	(0.012)	(0.012)	(0.013)	(0.014)	(0.015)
N.	77343	574209	573853	573766	573491	441651	574464
Pseudo R^2	0.027	0.060	0.023	0.045	0.048	0.033	0.064

Note: Ordered logit estimates. Robust standard errors clustered at the province level in parentheses. Individual characteristics, time and province fixed effects, as described in equation (1), included but not reported. * and ** denote statistical significance at 0.05 and 0.01 level, respectively.

Table 5: Social interactions as moderators

	(1) Life	(2) Health	(3) Family	(4) Friends	(5) Leisure	(6) Work	(7) Econ.
Time friends	-0.348	0.190**	0.206**	0.290**	0.082	-0.040	-0.142*
	(0.437)	(0.043)	(0.052)	(0.076)	(0.055)	(0.050)	(0.056)
Time out	2.045**	0.269**	0.128**	0.203**	-0.051	0.416**	0.377**
	(0.310)	(0.065)	(0.037)	(0.076)	(0.043)	(0.054)	(0.070)
Associations	0.043	-0.257**	0.104*	0.052	-0.010	0.134	0.009
	(0.493)	(0.043)	(0.040)	(0.074)	(0.086)	(0.071)	(0.066)
N.	77343	574209	573853	573766	573491	441651	574464
R^2	0.091	0.103	0.040	0.086	0.104	0.065	0.126

Note: the table reports only interaction terms, as described in equation (2); individual characteristics, time and province fixed effects, as described in equation (1), included but not reported. OLS estimates, robust standard errors clustered at province-level reported in brackets. * and ** denote statistical significance at 0.05 and 0.01 level, respectively.

Table 6: Unemployment and social interactions

	(1) Time friends	(2) Time out	(3) Associations
Unemployment rate	-0.024	-0.214*	-0.062*
	(0.090)	(0.082)	(0.028)
N.	611532	588344	593880
R^2	0.13	0.20	0.05

Note: OLS estimates, robust standard errors clustered at province level reported in brackets. Individual characteristics, time and province fixed effects, as described in equation (1), included but not reported. * and ** denote statistical significance at 0.05 and 0.01 level, respectively.

Table 7: Social interactions as mediators

	(1) Life	(2) Health	(3) Family	(4) Friends	(5) Leisure	(6) Work	(7) Econ.
Time friends	-0.004	-0.001	-0.001	-0.006	-0.005	-0.001	-0.001
	(0.017)	(0.005)	(0.003)	(0.024)	(0.021)	(0.004)	(0.005)
Time out	-0.038*	-0.016**	-0.008*	-0.022*	-0.028**	-0.007*	-0.020*
	(0.015)	(0.006)	(0.003)	(0.009)	(0.011)	(0.003)	(0.008)
Associations	-0.007	0.000	-0.002*	-0.004*	-0.003*	-0.001	-0.001
	(0.004)	(0.000)	(0.001)	(0.002)	(0.001)	(0.000)	(0.001)

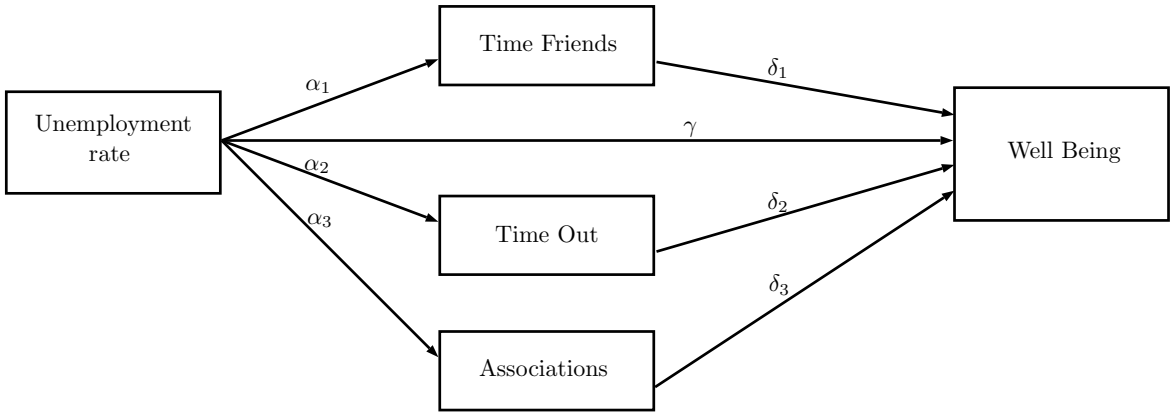
Note: Each cell reports the indirect effect of province-level unemployment on the SWB indicator reported in the column header via the mediator reported in the row header ($\alpha_j \delta_j$ in Figure 1). Estimates are obtained with a SUR estimator, as detailed in Section 3. Robust standard errors clustered at province level reported in brackets. * and ** denote statistical significance at 0.05 and 0.01 level, respectively.

Table 8: Direct and indirect effects of unemployment

	(1) Life	(2) Health	(3) Family	(4) Friends	(5) Leisure	(6) Work	(7) Econ.
Total indirect	-0.049	-0.017*	-0.011*	-0.032	-0.036	-0.009	-0.023*
	(0.027)	(0.009)	(0.005)	(0.028)	(0.026)	(0.006)	(0.011)
Direct	-3.990**	-0.188*	-0.04	-0.255**	-0.009	-0.03	-0.519**
	(1.000)	(0.085)	(0.077)	(0.093)	(0.128)	(0.216)	(0.104)

Note: robust standard errors clustered at province level reported in brackets. * and ** denote statistical significance at 0.05 and 0.01 level, respectively.

Figure 1: Mediating role of social interactions



Macroeconomic Conditions and Well-being: Do Social Interactions Matter?

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Abstract

This paper investigates the role played by social interactions as moderators and mediators of the effects of macroeconomic conditions on well-being. Using survey data for a representative sample of Italian individuals, we find that social interactions play a dual role. On the one hand, the well-being of people who spend more time with their friends or go out more often is less sensitive to the effects of macroeconomic fluctuations. On the other hand, social interactions are negatively affected by worsening macroeconomic conditions, thus playing a relevant role in the transmission of macroeconomic shocks to subjective well-being. More specifically, the negative impact of downturns on frequency of going out and active participation in associations significantly contributes to the adverse effects of recessions on satisfaction with life and with individual life domains.

Keywords: unemployment, social interactions, well-being.
JEL codes: E32, I31, I38

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1 Introduction

Since the seminal work by Di Tella et al. (2003), it has been widely documented that macroeconomic conditions matter for subjective well-being (Deaton, 2012; Mohseni-Cheraghlou, 2013; Helliwell and Huang, 2014; Cahill et al., 2015; Blanchflower et al., 2014; Frijters et al., 2015; Hariri et al., 2015; Ratcliffe and Taylor, 2015; Mertens and Beblo, 2016).[1] What is less clearly understood is the underlying transmission mechanism. The standard view is that macroeconomic fluctuations generate income and wealth shocks at individual level, which, in turn, impact on consumption patterns and, ultimately, on well-being (Stanca and Veenhoven, 2015). In addition, negative macroeconomic performance produces economic stress, which changes the subjective perception of individual economic prospects and enhances the fear of not being able to cope with financial obligations (Hagan et al., 1982).

This paper studies the role played by social interactions in moderating and mediating the effect of macroeconomic fluctuations on well-being, a relatively unexplored channel of the transmission mechanism. More specifically, we focus on social interactions in their specific role as consumption goods (i.e., relational goods). It is well known that social interactions play a significant role for individual well-being (Diwan, 2000; Aslam and Corrado, 2007; Becchetti et al., 2008; Bruni and Stanca, 2008; Bartolini and Bilancini, 2010; Gui and Stanca, 2010; Becchetti et al., 2011; Van der Horst and Coffé, 2012; Böckerman et al., 2016). At the same time, social interactions do have a cost, either direct or indirect, and can therefore be affected by the state of the economy. More specifically, worsening economic conditions can be expected to adversely affect the consumption of social interactions through a standard income effect. On the other hand, during downturns the opportunity cost of time-intensive activities is reduced (Ruhm, 2000). This may positively affect the demand for and consumption of time-intensive goods, such as social interactions and, in particular, interactions with family and friends.

Social interactions may therefore act as a positive or negative mediator of the effect of aggregate fluctuations on well-being, with the direction of the effect being, *a priori*, ambiguous. To the extent that their consumption is procycical (anticyclical), social interactions can be expected to enhance (offset) the effecs of macroeconomic conditions on well-being. In addition, social interactions may provide support (Wills, 1991), solidarity, a sense of belonging (Becchetti et al., 2008), positive psychological states (Uchino et al., 1999) and positive emotions (Bradburn, 1969), that can contribute to moderate the effects of macroeconomic fluctuations on subjective well-being (Gore, 1978; Berkman and Glass, 2000; Reeskens and van Oorschot, 2014): the well-being of individuals who enjoy higher levels of social interactions can be expected, ceteris paribus, to be less sensitive to the effects of macroeconomic fluctuations.

[1] More recently, a number of authors have focused on the effects of the current economic and financial crisis in terms of subjective well-being (Deaton, 2012; Hoynes et al., 2012; McInerney et al., 2013; Helliwell and Huang, 2014; Hariri et al., 2015; Chadi, 2015).

In this paper, we aim at assessing the mediating and moderating role played by social interactions for the effects of macroeconomic conditions on well-being within a simple framework. Our empirical analysis exploits a large and representative sample of Italian individuals between 1993 and 2012. We focus on three domains of social interactions: time spent with friends, frequency of going out for leisure activities, and active participation in associations. Our findings indicate that social interactions play a dual role as both mediators and moderators. On the one hand, the adverse effect of province-level unemployment on life satisfaction is less strong for those who go out more often, and the negative effects on satisfaction with life domains are less strong for those who spend more time with their friends or go out more often. On the other hand, frequency of going out plays a significant role as a positive mediator of the effect of province-level unemployment on satisfaction with life and with individual life domains. Participation in associations also acts as a significant mediator of the effect of the local unemployment rate on satisfaction with family, friends and leisure.

The remainder of the paper is structured as follows. Section 2 briefly discusses the related literature. Sections 3 and 4 describe the data and methods, respectively. Section 5 presents the results. Section 6 concludes.

2 Related literature

The costs of recessions are widely acknowledged to be much larger, overall, than the purely economic costs measured in terms of income loss. They include, for example, loss of human capital, as lower disposable income reduces school enrolment rates, particularly in countries where the economic cost of education is substantial (Dellas and Koubi, 2003); adverse health effects, as economic uncertainty triggers stress-related diseases (Stuckler et al., 2009); higher crime rates (Gould et al., 2002). Recessions may also have an impact on family decision making: economic uncertainty and negative income shocks may discourage long term commitments such as marriage; they may also decrease the probability of costly decisions such as asking for a divorce. As a consequence, both marriage and divorce rates tend to be pro-cyclical (Schaller, 2013; Hellerstein et al., 2013; González-Val and Marcén, 2015). More generally, during economic downturns individuals can change their time allocation in favor of leisure activities (Aguiar et al., 2013) and home production (Burda and Hamermesh, 2010). All these factors can be expected to affect individuals' well-being.

The recent economic crisis provides a sort of magnifying glass through which these effects can be observed. Deaton (2012) and Cahill et al. (2015) show that in the United States the financial crisis has significantly reduced job satisfaction and life satisfaction, while sharply increasing stress. Helliwell and Huang (2014) document significant costs associated with worsening labor market conditions. For those who are unemployed, the impact on well-being from an increase in the un-

employment rate is much larger than that deriving from lower income. However, even for those who are employed, a 1% decrease in the local unemployment rate has a similar impact on well-being to a 4% fall in income. Mertens and Beblo (2016) show that during the economic crisis individuals in the UK and Germany reported lower satisfaction with life, employment and health. Recessions matter for society as a whole, so that focusing only on the economic dimension would lead to underestimate their effects.

Our analysis focuses on social interactions, an important source of social support (Wills, 1991) and, as a consequence, a key determinant of well-being. The relationship between social support and well-being can be explained through a two-fold mechanism, direct and indirect. The direct mechanism points to a positive influence of social support on mental and physical health, which, in turn, affects well-being. There is considerable evidence of this mechanism in the medical and psychological literature. Tomioka et al. (2016) show that participation in social activities improves older adults' ability to perform the activities of daily living, significantly improving quality of life. Cole et al. (2015) find that perceived social isolation is linked to an increase in the stress hormone cortisol, high blood pressure and inflammation in the body, while it can diminish executive function, learning, and memory. Cacioppo and Cacioppo (2014) find that loneliness can impair executive functioning, sleep, and mental and physical well-being, contributing to higher rates of morbidity and mortality in lonely older adults. Finally Luo et al. (2012) show that chronic perception of social isolation increases a person's chance of premature death by 14 per cent. The impact of perceived loneliness on premature death is almost as strong as the impact of living in poverty and far stronger than the impact of obesity. In psychology, Baumeister and Leary (1995), Ryan and Deci (2001), and Kahneman et al. (2004) find a strong positive link between social interactions and happiness.

The indirect mechanism, instead, considers social support within a broader framework, whereby the negative effect of stressful situations on well-being can be mitigated by the availability of external resources, i.e., social support, and the availability of internal resources, such as coping strategies and personality traits (Bovier et al., 2004; Barrera et al., 2006). More generally, social interactions generate a sense of belonging to a group or a community, which is often associated to positive emotional states (Davidson et al., 1991) and individual well-being (Cicognani et al., 2008). As a result, social interactions may act as shock absorbers, dampening the deleterious effects of adverse economic shocks on well-being. Economic downturns can affect the consumption of time-intensive goods (Ruhm, 2000), such as social interactions and, through this channel, individual well-being.

In this paper we focus on social interactions in their role as relational goods. Uhlaner (1989) and Gui (1987) define relational goods as goods that "can only be possessed by mutual agreement that exist, after appropriate joint actions taken by a person and non-arbitrary others"(1989, p. 254). Relational goods are, therefore, local-public and anti-rival goods, since they cannot be enjoyed by an isolated in-

dividual, but, rather, they can be consumed only when shared with others (Bruni and Stanca, 2008). As such, they produce positive externalities. The most important producers of these goods are family and friends. On a larger scale, they can also be produced by social events, such as concerts and sport events (Becchetti et al., 2008), or by actively engaging in volunteering associations.

A number of studies have found a positive link between the consumption of relational goods and well-being. Based on a large sample of individuals from the World Values Survey, Bruni and Stanca (2008) found that the relational component of volunteering is positively and significantly associated with higher life satisfaction, with the size of the effect being equivalent to moving up by one decile in the income scale (see also Becchetti et al. (2011) for a closely related study). Time spent with parents and relatives, or friends and people at volunteering organizations, has a positive effect on life satisfaction. Becchetti et al. (2008) investigated the impact of sociality on individual well-being, testing the hypothesis that people with a more intense relational life are happier. Their findings indicate that relational activities have significant and positive effects on self-reported life satisfaction, even when reverse causality is explicitly taken into account. Stanca (2009) used implicit valuations estimated from life satisfaction equations to measure quality of relational life and compare it across countries throughout the world, finding that better macroeconomic conditions are associated with a higher quality of relational life.

3 Data

Our empirical analysis is based on individual-level data from the "Multipurpose survey on households: aspects of daily life"(ISTAT, 2015), which has been conducted on an annual basis since 1993 by the Italian Statistical Office through face-to-face interviews on a rotating sample of about 24,000 households (50,000 individuals) per year. This survey provides information on several aspects of daily life, including individual and household characteristics, work, family and social life, time use, political and social participation, health, lifestyle, satisfaction with life and with individual life domains. We consider all annual waves from 1993 to 2012 (in 2004 the survey was not conducted).

Following Colombo and Stanca (2014), social interactions are measured by focusing on three domains: time spent with friends, frequency of going out for leisure activities, and active participation in associations. Table 1 presents descriptive statistics for indicators of social interactions at individual level.

[TABLE 1]

Time spent with friends is measured on the basis of the following question: "How often in your free time do you meet with friends? (never, few times per year,

less than 4 times per month, once a week, more than once a week, every day)". We construct a binary indicator that takes value 1 for individuals who report to meet with friends at least once a week. Social interactions through recreational activities are measured by aggregating 7 variables that measure the frequency of participation in the following leisure activities: theater, cinema, museums, opera, concerts, sport events, dance.[2] We construct the overall indicator at individual level as a dummy variable that is equal to one if any of the 7 variables is greater than or equal to 3. The resulting indicator therefore identifies individuals who go out more frequently (at least 4-6 times per year) in at least one of the recreational activities being considered. Social interactions through social involvement are measured by focusing on active participation in four types of associations: volunteering, non-volunteering, parties and trade unions. For each type of association, a dummy variable indicates whether the individual has participated actively during the previous 12 months. We construct the individual-level indicator as a dummy variable equal to one if the individual has participated actively in at least one type of association.[3]

Table 2 provides summary statistics for the key variables used in the empirical analysis. Life satisfaction, available only since 2010, is measured on a scale between 0 and 10. Satisfaction with life domains (health, family, friends, leisure, work, economic conditions), available for all years, is measured as a categorical variable with four possible ordered categories: very much, enough, not much, not at all.[4] We restrict the sample to individuals between the age of 18 and 66, and further exclude from the analysis individuals who retired or are unable to work. This yields a final sample size of about 620,000 individuals, overall.

[TABLE 2]

Local economic conditions are measured by province-level unemployment rate, from the *Territorial Accounts* by ISTAT. Since the Italian geographical disaggregation at NUTS-3 level has changed during the period considered, we reclassified provinces to 103 in order to have geographical units that are consistent throughout the period considered and compatible with those contained in the individual-level survey described above.

[2]Each variable takes values from 1 to 5 corresponding to the following categories: never, 1-3 times per year, 4-6 times per year, 7-12 times per year, more than 12 times per year.

[3]It should be noted that this variable refers to active participation, as opposed to mere membership, and is therefore intended to capture the relational dimension of social interactions, rather than the network dimension (Bruni and Stanca, 2008).

[4]Satisfaction with the environment was not considered in the analysis since it is only available since 2003.

4 Methods

Figure 1 illustrates the transmission mechanism that we investigate empirically. We assume that local economic conditions affect subjective well-being (SWB) both directly (as captured by the parameter γ) and indirectly, through their effect on social interactions, as captured by the parameters α_j and δ_j.

[FIGURE 1]

In our empirical specification, subjective well-being at individual level is modelled as a function of the province-level unemployment rate, indicators of social interactions and a set of individual-level controls, in addition to province and year fixed effects:

$$WB_{ipt} = \beta + \gamma U_{pt} + \sum_j \delta_j SI_{j,ipt} + X_{ipt}\Pi + \mu_p + \lambda_t + \varepsilon_{ipt} \quad (1)$$

where WB_{ipt} denotes subjective well-being of individual i in province p at time t, which is measured by satisfaction with life or satisfaction with individual life domains, U_{pt} is the unemployment rate in province p at time t, $SI_{j,ipt}$ represents individual indicators of social interactions, as described in Section 3, X is a vector of individual-level controls (marital status, education, age, gender, etc.), with coefficients denoted by Π. μ_p and λ_t denote province and time (year) fixed effects, while ε_{ipt} is the individual-level error term.

Given the cross-sectional nature of the data set, it should be observed that estimates for γ could reflect unobserved heterogeneity, since unobserved factors might co-determine both subjective well-being and macroeconomic conditions. While reverse causality is unlikely, given that subjective well-being at individual level should not be expected to determine macroeconomic fluctuations, the issue of unobserved heterogeneity is more relevant. In the absence of longitudinal data, or appropriate instrumental variables, we consider specifications that include province-level fixed effects to control for any unobservable time-invariant province-specific effect (e.g., differences in lifestyle across provinces) and year fixed effects to capture unobserved aggregate time effects or time trends. Estimates for δ_j could also be biased since social interactions are not exogenous with respect to well-being. One possible source of omitted variable bias, could be income. Since we do not have a direct measure of income, we include among the controls education level, occupation status and type of occupation. For ease of interpretation, we present Ordinary Least Square (OLS) estimates for equation (1). In order to assess the robustness of the results, we also present Ordered Logit estimates, thus taking into account the ordinal nature of the dependent variables. Standard errors, robust to heteroskedasticity, are clustered at the province level.

The moderating role played by social interactions is assessed by estimating the specification in (1) while also allowing for an interaction between each indicator of social interactions and local unemployment, as described below:

$$WB_{ipt} = \beta + \gamma U_{pt} + \sum_j \delta_j SI_{j,ipt} + \sum_j \theta_j (U_{pt} * SI_{j,ipt}) + X_{ipt}\Pi + \mu_p + \lambda_t + \varepsilon_{ipt} \quad (2)$$

In order to estimate the mediating effect of social interactions for the relationship between macroeconomic conditions and subjective well-being, we follow the approach proposed by Preacher and Hayes (2008). We use Seemingly Unrelated Regression (SUR) to estimate the effect of local economic conditions on social interactions (α_j) and the effect of social interactions on subjective well-being (δ_j). The indirect effect of local economic conditions on SWB via mediator j is then obtained as the product of the two coefficients ($\alpha_j \delta_j$). The total indirect effect of economic conditions on subjective well-being through social interactions is obtained as $\sum_j \alpha_j \delta_j$, and the overall effect as the sum of the direct and indirect effects (i.e., $\gamma + \sum_j \alpha_j \delta_j$).

5 Results

We start by characterizing the relationship between aggregate economic conditions and subjective well-being. We then focus on the role played by social interactions as moderating and mediating factors, respectively.

5.1 Local unemployment and subjective well-being

Table 3 presents OLS estimates for equation (1), using either life satisfaction or satisfaction with individual life domains as a dependent variable. Each column reports, for a given well-being indicator, the estimated coefficient for the province-level unemployment rate and the individual-level indicators of social interactions. Province-level unemployment is negatively and significantly related to life satisfaction: a one-percentage point increase in the province-level unemployment rate is associated to a 0.04 drop in life satisfaction, on a scale between 0 and 10. All indicators of social interactions are positively and significantly related to life satisfaction. The size of the coeffcients is also relevant. Ceteris paribus, individuals with higher levels of time spent with friends, frequency of going out, or active participation in associations, report higher life satisfaction by 0.19, 0.18 and 0.11 points, respectively. In short, while province-level unemployment is negatively related to life satisfaction, higher levels of social interactions are positively related to life satisfaction.

[TABLE 3]

Focusing on satisfaction with individual life domains, province-level unemployment is negatively and significantly related to satisfaction with health, friends and economic conditions. It is also negatively related, although not significantly, with all other life domains. With only one exception (the relationship between active participation in associations and satisfaction with health) all indicators of social interactions are positively and significantly related to satisfaction with each life domain. To sum up, while local unemployment is negatively related to satisfaction with individual life domains, indicators of social interactions display a consistent pattern of a positive and significant relationship.

Table 4 presents estimation results obtained by using an ordered logit estimator, in order to take into account the ordinal nature of the dependent variable in equation (1). There are no qualitative differences with respect to the OLS estimates reported in Table 3. The unemployment rate is negatively related to satisfaction with life overall and, among life domains, to satisfaction with health, friends and economic conditions. All indicators of social interactions are positively and significantly related to satisfaction with life and with each life domain. Given the robustness of the results, and for ease of the interpretation of the coefficients, in the following we will focus on OLS estimates.

[TABLE 4]

5.2 The moderating role of social interactions

Table 5 presents estimation results for equation (2), reporting only the coefficients for the interaction term between province-level unemployment and each of the three indicators of social interactions. The results in column (1) indicate that the negative effect of province-level unemployment on life satisfaction is significantly les strong for individuals who enjoy a higher frequency of going out for leisure activities. The interaction terms for time spent with friends and active participation in associations are instead relatively small and not statistically significant.

[TABLE 5]

Focusing on satisfaction with individual life domains, both time spent with friends and frequency of going out play a significant moderating role for the effects of province-level unemployment. The interaction term between time spent with friends and province-level unemployment rate is positive and significant for satisfaction

with health, family and friends. It is instead negative and significant for satisfaction with economic conditions. The interaction term between frequency of going out and province-level unemployment is positive and significant for satisfaction with health, family, friends, work and economic conditions. Overall, the findings indicate that the negative effect of local unemployment on satisfaction with individual life domains is less strong for individuals who spend more time with their friends or go out more often for leisure activities.

5.3 The mediating role of social interactions

We now turn to the estimation of the indirect effects of province-level unemployment on well-being, as described in Figure 1. We start by assessing the potential role of social interactions as mediators of the relationship between local unemployment and well-being. Table 6 reports estimation results for the relationship between each indicator of social interactions and province-level unemployment, controlling for individual characteristics, time and province fixed effects. Higher province-level unemployment rates are associated to a significantly lower frequency of going out and participation in associations. In the equation for time spent with friends, the coefficient for unemployment is negative but not significant. Overall, the results indicate that worsening macroeconomic conditions negatively affect the consumption of social interactions.

[TABLE 6]

Next, we estimate the indirect effects of local economic conditions on well-being through social interactions, as illustrated in Figure 1. Table 7 reports the results. Each cell presents the indirect effect of province-level unemployment on the indicator of subjective well-being indicated in the column heading, through each of the three mediators (indicators of social interactions) reported in the row heading. Interestingly, the indirect effect of unemployment through frequency of going out is negative and significant for life satisfaction and for satisfaction with all individual life domains. Local unemployment also has a negative and significant indirect effect through participation in associations on satisfaction with family, friends and leisure. No significant indirect effect is found, instead, through time spent with friends.

[TABLE 7]

Table 8 reports the total indirect effect of local unemployment on subjective well-being, i.e. the sum of the indirect effects through each mediator ($\sum_{j=1}^{3} \alpha_j \delta_j$ in

Figure 1) and, for a comparison, the corresponding direct effect (γ in Figure 1). As expected, the total indirect effect, reported in the first row, is generally substantially smaller than the direct effect, reported in the second row. The total indirect effect is negative for life satisfaction and for each life domain. It is also statistically significant for satisfaction with health (-0.017), family (-0.011) and economic conditions (-0.023).

[TABLE 8]

6 Conclusions

We investigated empirically the role played by social interactions for the relationship between macroeconomic conditions and subjective well-being. Overall, the results indicate that social interactions play a dual role as both moderators and mediators of this relationship. On the one hand, people who experience higher levels of social interactions are found to be less sensitive, in terms of well-being, to the effects of macroeconomic fluctuations. More specifically, the adverse effect of economic downturns on subjective well-being are found to be lower for those who spend more time with their friends or go out for leisure activities more often, reflecting the relevant role played by social support and solidarity. On the other hand, social interactions are themselves negatively affected by worsening macroeconomic fluctuations, thus representing a relevant factor for the transmission of macroeconomic shocks to subjective well-being. Frequency of going out for leisure activities is found to play a significant role in transmitting the adverse effects of local unemployment on satisfaction with life and with individual life domains. Active participation in associations is also found to play a significant mediating role for the adverse effects of local unemployment on satisfaction with family, friends and leisure.

This paper suggests that social interactions play a relevant role in the transmission of macroeconomic shocks to individual well-being. Social interactions can mobilize human and material resources that can provide support and protection during economic downturns, therefore affecting *individual* well-being. At the same time, they can significantly contribute to *collective* well-being, by making up for the shortcomings of the welfare state in times of crisis. Social interactions can therefore be viewed as shock absorbers, that may dampen the deleterious effects of economic shocks on well-being. However, since macroeconomic conditions affect the consumption of relational goods, social interactions also contribute to transmit the negative effects of adverse macroeconomic shocks.

Overall, our findings indicate that, in order to be successful, macroeconomic policies need to be complemented by measures aimed at avoiding the adverse effects of macroeconomic conditions on the relational life of individuals. This paper opens up the way for further studies in this direction.

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Table 1: Descriptive statistics, indicators of social interactions

Variable	Mean	Std. Dev.	Min.	Max.	N
Time spent with friends					
Never	0.04	0.20	0	1	624606
Yearly	0.06	0.24	0	1	624606
Monthly	0.17	0.38	0	1	624606
Weekly	0.23	0.42	0	1	624606
More than weekly	0.30	0.46	0	1	624606
Daily	0.20	0.40	0	1	624606
Frequency of going out					
Theater	1.25	0.60	1	5	612213
Cinema	1.90	1.14	1	5	614088
Museum	1.39	0.72	1	5	610678
Opera	1.14	0.48	1	5	610917
Concert	1.29	0.62	1	5	610314
Sport	1.57	1.06	1	5	611111
Disco	1.61	1.14	1	5	612729
Active part. in associations					
No participation	0.88	0.33	0	1	606570
Volunteering	0.09	0.29	0	1	606570
Non-volunteering	0.02	0.15	0	1	606570
Party	0.00	0.06	0	1	606570
Trade union	0.00	0.03	0	1	606570

Source: "Multipurpose survey on households: aspects of daily life" (ISTAT, 2015)

Table 2: Descriptive statistics, individual level

Variable	Mean	Std. Dev.	Min.	Max.	N
Satisfaction with health	3.06	0.63	1	4	607112
Satisfaction with family	3.31	0.61	1	4	606620
Satisfaction with friends	3.12	0.66	1	4	606488
Satisfaction with leisure	2.68	0.78	1	4	606135
Satisfaction with work	2.88	0.71	1	4	462872
Satisfaction with econ. c.	2.45	0.74	1	4	607438
Life satisfaction	7.14	1.64	0	10	80638
Time spent with friends	0.5	0.5	0	1	616729
Frequency of going out	0.39	0.49	0	1	593321
Participation associations	0.12	0.33	0	1	598882
Unemployment rate	0.1	0.07	0.01	0.33	620256
Gender (male)	0.49	0.5	0	1	620256
Age	42.13	12.79	18	66	620256
Age squared	1938.52	1096.92	324	4356	620256
Work: Employed	0.6	0.49	0	1	620256
Work: Student	0.16	0.36	0	1	620256
Work: Housewife	0.04	0.21	0	1	620256
Married	0.64	0.48	0	1	620256
Divorced	0.02	0.13	0	1	620256
Widowed	0.03	0.17	0	1	620256
Number of children	0.96	1.02	0	10	620256
Upper education	0.37	0.48	0	1	620256
Lower education	0.17	0.37	0	1	620256
Executive	0.04	0.2	0	1	614976
Clerk	0.2	0.4	0	1	614976
Worker	0.21	0.4	0	1	614976
Self-employed (high)	0.05	0.22	0	1	614976
Self-employed (low)	0.11	0.31	0	1	614976

Source: "Multipurpose survey on households: aspects of daily life" (ISTAT, 2015)

Table 3: Unemployment, social interactions and well-being (OLS)

	(1) Life	(2) Health	(3) Family	(4) Friends	(5) Leisure	(6) Work	(7) Econ.
Unemp. rate	-3.990**	-0.188*	-0.040	-0.255**	-0.009	-0.030	-0.519**
	(1.001)	(0.085)	(0.077)	(0.093)	(0.128)	(0.216)	(0.104)
Time friends	0.185**	0.052**	0.036**	0.263**	0.231**	0.048**	0.056**
	(0.016)	(0.003)	(0.004)	(0.005)	(0.004)	(0.003)	(0.004)
Time out	0.177**	0.074**	0.036**	0.103**	0.130**	0.034**	0.095**
	(0.017)	(0.002)	(0.003)	(0.003)	(0.004)	(0.003)	(0.005)
Associations	0.111**	0.006	0.033**	0.058**	0.047**	0.013**	0.017**
	(0.021)	(0.003)	(0.003)	(0.004)	(0.005)	(0.005)	(0.005)
N.	77343	574209	573853	573766	573491	441651	574464
R^2	0.09	0.10	0.04	0.09	0.10	0.07	0.13

Note: OLS estimates. Robust standard errors clustered at province level reported in brackets. Individual characteristics, time and province fixed effects, as described in equation (1), included but not reported. * and ** denote statistical significance at 0.05 and 0.01 level, respectively.

Table 4: Unemployment, social interactions and well-being (ordered logit)

	(1) Life	(2) Health	(3) Family	(4) Friends	(5) Leisure	(6) Work	(7) Econ.
Unemp. rate	-4.672**	-0.629*	-0.102	-0.768**	-0.072	-0.114	-1.700**
	(1.346)	(0.298)	(0.263)	(0.291)	(0.323)	(0.567)	(0.279)
Time friends	0.203**	0.176**	0.108**	0.802**	0.590**	0.137**	0.157**
	(0.020)	(0.010)	(0.012)	(0.016)	(0.011)	(0.009)	(0.011)
Time out	0.182**	0.253**	0.111**	0.312**	0.326**	0.095**	0.269**
	(0.021)	(0.009)	(0.011)	(0.010)	(0.009)	(0.010)	(0.014)
Associations	0.120**	0.029*	0.125**	0.188**	0.121**	0.052**	0.053**
	(0.025)	(0.013)	(0.012)	(0.012)	(0.013)	(0.014)	(0.015)
N.	77343	574209	573853	573766	573491	441651	574464
Pseudo R^2	0.027	0.060	0.023	0.045	0.048	0.033	0.064

Note: Ordered logit estimates. Robust standard errors clustered at the province level in parentheses. Individual characteristics, time and province fixed effects, as described in equation (1), included but not reported. * and ** denote statistical significance at 0.05 and 0.01 level, respectively.

Table 5: Social interactions as moderators

	(1) Life	(2) Health	(3) Family	(4) Friends	(5) Leisure	(6) Work	(7) Econ.
Time friends	-0.348	0.190**	0.206**	0.290**	0.082	-0.040	-0.142*
	(0.437)	(0.043)	(0.052)	(0.076)	(0.055)	(0.050)	(0.056)
Time out	2.045**	0.269**	0.128**	0.203**	-0.051	0.416**	0.377**
	(0.310)	(0.065)	(0.037)	(0.076)	(0.043)	(0.054)	(0.070)
Associations	0.043	-0.257**	0.104*	0.052	-0.010	0.134	0.009
	(0.493)	(0.043)	(0.040)	(0.074)	(0.086)	(0.071)	(0.066)
N.	77343	574209	573853	573766	573491	441651	574464
R^2	0.091	0.103	0.040	0.086	0.104	0.065	0.126

Note: the table reports only interaction terms, as described in equation (2); individual characteristics, time and province fixed effects, as described in equation (1), included but not reported. OLS estimates, robust standard errors clustered at province-level reported in brackets. * and ** denote statistical significance at 0.05 and 0.01 level, respectively.

Table 6: Unemployment and social interactions

	(1) Time friends	(2) Time out	(3) Associations
Unemployment rate	-0.024	-0.214*	-0.062*
	(0.090)	(0.082)	(0.028)
N.	611532	588344	593880
R^2	0.13	0.20	0.05

Note: OLS estimates, robust standard errors clustered at province level reported in brackets. Individual characteristics, time and province fixed effects, as described in equation (1), included but not reported. * and ** denote statistical significance at 0.05 and 0.01 level, respectively.

Table 7: Social interactions as mediators

	(1) Life	(2) Health	(3) Family	(4) Friends	(5) Leisure	(6) Work	(7) Econ.
Time friends	-0.004	-0.001	-0.001	-0.006	-0.005	-0.001	-0.001
	(0.017)	(0.005)	(0.003)	(0.024)	(0.021)	(0.004)	(0.005)
Time out	-0.038*	-0.016**	-0.008*	-0.022*	-0.028**	-0.007*	-0.020*
	(0.015)	(0.006)	(0.003)	(0.009)	(0.011)	(0.003)	(0.008)
Associations	-0.007	0.000	-0.002*	-0.004*	-0.003*	-0.001	-0.001
	(0.004)	(0.000)	(0.001)	(0.002)	(0.001)	(0.000)	(0.001)

Note: Each cell reports the indirect effect of province-level unemployment on the SWB indicator reported in the column header via the mediator reported in the row header ($\alpha_j \delta_j$ in Figure 1). Estimates are obtained with a SUR estimator, as detailed in Section 3. Robust standard errors clustered at province level reported in brackets. * and ** denote statistical significance at 0.05 and 0.01 level, respectively.

Table 8: Direct and indirect effects of unemployment

	(1) Life	(2) Health	(3) Family	(4) Friends	(5) Leisure	(6) Work	(7) Econ.
Total indirect	-0.049	-0.017*	-0.011*	-0.032	-0.036	-0.009	-0.023*
	(0.027)	(0.009)	(0.005)	(0.028)	(0.026)	(0.006)	(0.011)
Direct	-3.990**	-0.188*	-0.04	-0.255**	-0.009	-0.03	-0.519**
	(1.000)	(0.085)	(0.077)	(0.093)	(0.128)	(0.216)	(0.104)

Note: robust standard errors clustered at province level reported in brackets. * and ** denote statistical significance at 0.05 and 0.01 level, respectively.

Figure 1: Mediating role of social interactions