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SOCIAL CAPITAL AND UNDECLARED WORK: AN EMPIRICAL ANALYSIS IN ITALY FROM 1998 TO 2008

Maria Felice Arezzo¹

ABSTRACT

The issue of irregular work has been well known in Italy since the early seventies. Undeclared work is a particular facet of shadow economy where employers evade tax typically by underreporting either the numbers of workers or the hours worked or both and, by this mean, they avoid paying the legally due social security contributions. As any form of shadow activity, undeclared work introduces important biases in the economic system. That is why, it is of paramount interest for policy makers to understand which are the factors influencing undeclared work. The Italian National Institute of Statistics has developed a methodology in the vanguard to estimate the rate of irregular work and today we have time series long enough for a review of the phenomenon. When looking at regional rates of irregular work it's stunning how dissimilar they are and this dissimilarity is kept over time. This paper aims to understand the reasons of this heterogeneous dynamics and to identify it's determinants, focusing in particular on the role of social capital. We use a dynamic panel model to measure the impact of social capital and of some other relevant variables on regional irregular work rates. We find that social capital ha a significant effect. It reveals itself to be a key factor in hindering the use of irregular workers.

Classification JEL: H26, C23, O17, J01.

Keywords: Social capital, Undeclared work, Arellano-Bond estimator, Dynamic panel model .

1. INTRODUCTION

Shadow economy is the part of an economy which is not declared for tax and that typically involves exchange of goods and services which are paid for in cash. A lot of effects derive directly from shadow economy, mainly because it introduces important biases on:

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1. Equity: similar situations are treated differently from a fiscal perspective;
2. Competition: those who don't pay taxes have an advantage because they reduce their costs;
3. Tax systems: to fund public expenditure, taxes are raised;
4. Size of important economic variables (GNP, growth, tax burden, unemployment, productivity).

Schneider (38) clearly states that there are many important reasons for the Governments to be very concerned about the rise of the shadow economy. On one hand, a growing shadow economy can be seen as the reaction of individuals to tax burden and to the malfunctioning of institutions. In this case there might be a vicious circle of a further increase in the budget deficit or tax rates, additional growth of the shadow economy, and gradual weakening of the economic and social basis of collective arrangements. On the other hand shadow economy may attract (domestic and foreign) workers away from the official economy and create an unfair competition for official firms. A positive effect of shadow economy is that income earned is immediately spent in the official economy.

Moreover, theoretical knowledge on the dimension and on who is involved in shadow activities is crucial to make an efficient allocation of resources to contrast these irregular activities. In Schneider (39) it is argued that another side effect is that if a country suffers from an increasing (or substantial) shadow economy, policy makers base their decision on mistaken official indicators.

This brief discussion clarifies why it is of paramount interest for Governments to decipher which are the key factors that influence underground activities.

Most of the studies on shadow economy and tax evasion date back to the early seventies. The seminal work of Allingham-Sadmo (6) models tax evasion as a portfolio choice: taxpayers decide to not comply if they evaluate that they might have a monetary gain in evading. The gain depends on the amount of fines they will have to pay if detected and on the probability of being detected. The higher the expected punishment (given by the product of fines and the probability of detection) the lower the tax evasion. The successive studies improved the basic model.

Most literature identifies the following as determinants for tax evasion: tax burden; people's perception on the quality of public spending; tax complexity; the credibility of fiscal authorities in collecting taxes.

Unfortunately at least one question remains with no answer: why, within the same country, does there exist perceivably different levels of underground economy? It suggests that there are some other factors that play a key role on shadow economy and we strongly believe that social capital theory may be very helpful.

The effect of social capital on shadow economy has been explored by economists only recently.

Kanniainen et al. (27) developed a model, tested on 21 OECD countries, that explores the importance of moral sentiments on the control of underground economy. The empirical analysis shows that the main determinants of shadow economy are taxation and social security variables as well as tax morale.

Morality is seen as a particular form of social capital^a, being a network good shared by people belonging to the same community. Deviant behavior, being socially stigmatized, is avoided by people especially if there is a high risk of being detected. Therefore moral sentiments operate as a mechanism which limits shadow activities.

Torgler (40; 41; 42) shows the existence of empirical evidence that reveals a strong negative correlation between tax morale and shadow economy in United States, Asia and Latin America. In Alm (7) the same relation is found for Russia.

One important facet of shadow economy is undeclared work, defined as (EU definition) *any paid activities that are lawful as regards their nature but not declared to the public authorities, taking into account differences in the regulatory systems of Member States*. This definition excludes criminal activities and work which does not have to be declared.

When we refer to undeclared work we are talking about a special form of tax evasion perpetrated by employers. Sure enough employers have the responsibility of withholding the tax from the gross wages of all of their workers. By underreporting^b the real size of labor force to the social security authorities, employers evade payment of the legally due social security contributions.

We focus our attention on undeclared work and in particular, on the role that social capital has on preventing the use of irregular workers. To our knowledge there is no study that investigates in depth the relationship between undeclared work and social capital. The aim of this paper is to contribute to the literature by filling this gap.

The mechanism through which social capital has an effect on undeclared work is simple. When hiring a non regular worker, the employer knows that he/she is risking being reported by the employee. The risk is comeasurably harder to bear when the reference community of the employer condemn deviant behavior.

Four main groups of undeclared workers can be identified:

1. persons with more than one job;

^aAccording to the World Bank, social capital includes the institutions, the relationships, the attitudes and values that govern interactions among people and contribute to economic and social development. In section 2 there is a throughout discussion on social capital.

^bThe evasion can be done in many different ways. Employers can declare the right number of workers, but under report the hours worked or the position covered. An extreme form of underreporting occurs when employer completely hide to Fiscal authorities one or more workers.

2. persons who are inactive (students, housewives, early retired people);
3. unemployed;
4. illegal immigrants.

The Italian National Institute of Statistics (ISTAT in the following) have developed a method to estimate the rate of irregular work^c(IWR) which is widely recognized to be in the vanguard. IWR estimates are available both at regional and national levels, for a time span long enough to allow for an accurate analysis. Unfortunately estimates are not produced at a smaller territorial level (like provinces) which would have allowed for a closer examination of the problem.

The remainder of this paper is structured as follows: in section 2 we review social capital definitions, the main difficulties related to its measurements and the solution adopted in this work; in section 3 we present the model used and the results obtained; in section 4 we move to some conclusions.

2. SOCIAL CAPITAL: DEFINITIONS AND MEASUREMENT ISSUES

The first glimmer of social capital as a concept dates back to the beginning of XXth century with the contribution of Hanifan (23; 24) who emphasized the importance of social structure to people with a business. In the last twenty years a flourishing multidisciplinary literature on the topic serves to enrich and qualify the concept of social capital.

There is a widespread agreement among researchers that social capital is the synthesis of three different point of view (22): the first, due to Putnam et al (34), defines social capital as those characteristics of social communities, such as networks of individuals and families together with norms that create externalities for the society as a whole; the second interpretation, referred to by Coleman (14; 15), defines social capital as *a variety of different entities which all consist of some aspect of social structure and which facilitate certain actions of actors - whether personal or corporate actors- within the structure*; the third is associated with Olson (33) and North (31) and includes the social and political environment that shapes social structure and allows for the development of norms.

The OECD and the World Bank define social capital respectively as *network, norms, values and understanding that facilitate co-operation within or among groups* (32) and as *institutions, relationships and norms that shape the quality and quantity of a society's social interactions* (43).

Theoretical research identifies a *structural* and a *cognitive* aspect of social capital, the first being related to actions of individuals and the second to their perception (12; 29; 28). Structural aspects appear in rules and in specific behavior

^cIWR is the ratio between the irregular and the total labor units.

(such as networking or volunteering activities), whereas cognitive aspects materialize as trust, shared values, empathy and respect towards community. The former are more easily measured objectively than the latter.

Structural social capital will be different among individuals because it is the result of individual action; cognitive social capital, on the other hand, will be homogeneous inside a community since it consists of a person's attitude and values.

Another important distinction can be drawn between *bonding* and *bridging* social capital (35): the first refers to the relations that an individual has within his/her "inner circle" whereas the second relates to ties with people outside the closest circle but belonging to the same socio-economic group.

This distinction is crucial in our context: if we refer to bonding social capital, there is vast evidence in the literature that societies wherein family ties are very strict and important to the culture, tend to have a lower degree of confidence in public institutions, a lower level of participation and less political involvement. See for example Fukuyama (20) for an interesting parallelism between Italian and Chinese society and Alesina-Giuliano (4; 5) for the effect of family ties on participation.

Therefore, bonding social capital would tend to increase shadow economy in general and undeclared work in particular. Indeed, if the irregular worker is a family member, he will not have any incentive to report his irregular position, because he doesn't want to hinder the family.

The same is true for any worker who has tight bonds with the employer. This bonds not necessarily need to be interpreted with a positive meaning: for example the close network established within a criminal community is a form of bonding social capital having the effect of increasing the amount of irregular workers hired. On this behalf, Fukuyama(21) says *Many groups achieve internal cohesion at the expense of outsiders, who can be treated with suspicion, hostility, or outright hatred. Both the Ku Klux Klan and the Mafia achieve cooperative ends on the basis of shared norms, and therefore have social capital, but they also produce abundant negative externalities for the larger society in which they are embedded.*

The effect of bonding social capital is an explanation of the wide-spread presence of irregular workers in Italian micro and small enterprises^d(10) which are typically run by a family.

Despite the complexity of the concept of social capital and of its unquestionable multidimensionality, a lot of empirical research measures it as a mono dimensional phenomenon. This is partly justified by the difficulties of finding data, especially when analysis spans several years. On this point see the criticisms of Fine (16; 17), Foley and Edwards (18; 19), Harriss (25).

^dThe micro and small firms are those with less than 10 employees.

In Grootaert-van Bastelaer (22) it is stated that *Like human capital, social capital is difficult, if not impossible, to measure directly; for empirical purposes the use of proxy indicators is necessary. Years of education and years of work experience have a long tradition as proxies for human capital and have proven their value in numerous empirical studies. No such acquired consensus yet exists for the study of social capital, and the search for the best proxy indicator continues. The SCP^e aimed to make a contribution in this critical area. The measurement challenge is to identify a contextually relevant indicator of social capital and to establish an empirical correlation with relevant benefit indicators. As the SCI studies demonstrate, these social capital indicators differ both geographically and by sector.*

The panel nature of the analysis, forced us to put some constraints on data: first of all, proxy indicators had to be available for the whole period and secondly they have to be measured homogeneously over time. These requirements forced us to exclude the European Union Statistics on Income and Living conditions survey (EU-SILC). This data source is quite rich and offers the opportunity to measure different dimensions of social capital. Unfortunately it begun only in 2004.

Our approach to build a social capital measure, follows Santini (37) who focuses on the underlying concepts of social capital. These are a) social behavior, b) social relationships, c) social engagement, d) civic responsibility and e) some territorial characteristics of the Italian regions. These concepts are in turn components of the two key dimensions of social capital: trust and participation. Figure represents the conceptual model of social capital whereas the proxy indicators selected are located in table 1.

The proxy indicators choice, and their relationship with the two main dimensions of social capital (i.e. trust and participation), are based on the following considerations:

- the variables belonging to social behavior (SB) dimension were selected because they hinder the development of trust and of a socio-economical cooperation among members of the regional community;
- for social relationships (SR), one measure of culture has been selected because cultural events can be an opportunity for the creation of mutual trust. Lack of SR and of mutual trust is measured by the variable Number of suicides per 100,000 inhabitants;
- for social engagement, the choice was a variable that measures solidarity. It is a typical social capital variable, related to participation;

^eSCI stands for Social Capital Initiative and is a World Bank network devoted to the study of social capital.

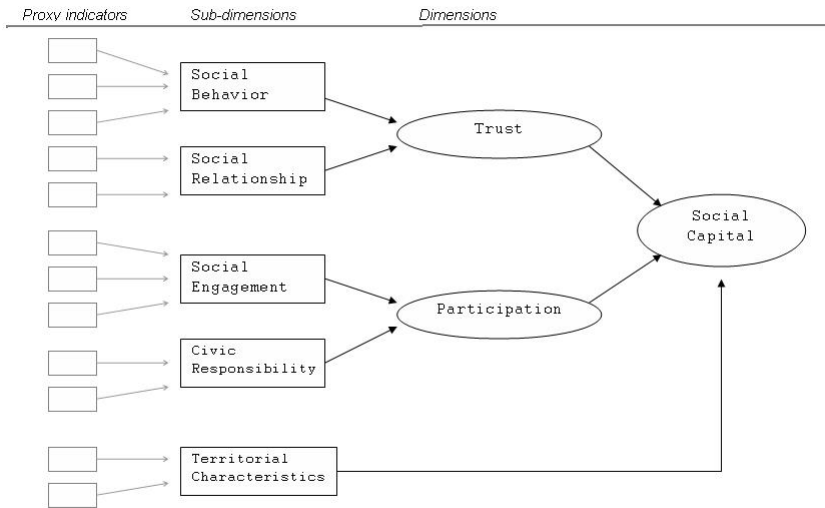


Figure 1: Conceptual model of Social capital index

- for civic responsibility, the selected variable (Number of television subscriptions per 100 families) measures the sense of civic duty toward institutions whereas the Percentage of voters at referendum is a measure of participation in politics;
- on behalf of the territorial characteristics, since they are significant determinants of social capital formation, a higher urbanization rate should encourage social and economic networking while a higher rate of territorial attraction should be a symptom of greater and better social and economic opportunities.

As a first step of the social capital index derivation, each region was assigned a score from 0 to 1 through normalization. The region with the best value (highest or lowest, depending on the proxy) were scored 1. Afterward, within each of the five categories, a synthetic indicator was found by averaging the variables belonging to that category.

The arithmetic mean was chosen to reflect the interchangeability among the variables. Finally the five category indexes have been pulled together through a geometric mean as it implies a lower interchangeability of categories. As a result of this process there is the overall social capital index.

3. THE ECONOMETRIC MODEL

This section contains the econometric model that we used to assess whether or not social capital has an effect on irregular work rate.

The data used spans from 1998 to 2008 and is measured on the 20 Italian regions. The dependent variable is (a transformation of) IWR.

Following the literature (1; 2; 3; 11; 13; 30; 8) and imposing the availability of data for the whole time span, we selected the following independent variables: unemployment rate, social capital index, capability to export, school drop-out rate, schooling, capability to innovate, bank credit intensity (Cred).

The UNEMPLOYMENT RATE (UnR) is the percentage of the total labor force currently unemployed. The labor force is the amount of people belonging to the subset identified by some age thresholds which vary from country to country (15 and 65 years in Italy) and who are actively employed or seeking for an employment. Note that this definition excludes some categories, for example undergraduate students (because they are not looking for a job) or housewives. The expected sign of the relation with the irregular work rate is positive; the hypothesis is that the higher the unemployed labor force the bigger the basin to draw from.

The SOCIAL CAPITAL INDEX (SCI) had been widely discussed in section 2. As already pointed out, SCI is likely to protect from irregularity and therefore the expected sign is negative.

The CAPABILITY TO EXPORT (Exp) is the value of exported goods as a percentage of gross domestic product (GDP). The expected sign is negative because firms oriented to foreign markets tend to be of bigger dimension and with a more efficient and complex structure; this inhibit the use of irregular workers.

SCHOOL DROP-OUT RATE (Drop) is the percentage of students who drop out school at the end of compulsory education (in Italy they have to be at least 15 years old). The sign is expected to be positive since very low skilled young people don't have many chances to get a good job.

SCHOOLING (school) is the number of students enrolled in upper secondary education out of the 14-18 years old population. Results is expressed in percentage. Expected sign is negative for the same reasons expressed in the previous point.

The CAPABILITY TO INNOVATE (Innov) is measured as the amount of expenses in research and development by private and public firms as a % of GDP. The expected sign is negative because innovation requires highly specialized labor which is very difficult to hire irregularly.

The BANK CREDIT INTENSITY (Cred) is the domestic credit (bank loans) provided by banking sector as a % of GDP. The sign is expected to be negative because an uneasy (and/or costly) access to credit may postpone investments and drag firms in marginal positions increasing the risk of irregularity.

A panel dataset consists of variables measured over time on the same units. The blend of inter-individual differences and intra-individual dynamics, provide

several advantages over cross-sectional or time-series data. The most important are: a) inferences of model parameters are more accurate. This is because, panel data have more degrees of freedom and more sample variability than cross-sectional data, enhancing the efficiency of statistical estimates; b) one can control for the impact of omitted variables. It is argued that the reason for finding (or not finding) certain effects is due to the omission of variables in the model; when the omitted variables are correlated with the included explanatory variables, a bias arises. Panel data, containing information on both the intertemporal dynamics and the individuality of the units, allow to control the effects of omitted variables;

We will start with some preliminary results that will be helpful in model specification.

Our analysis starts exploring the behavior of irregular work rate among regions and over time. Table 2 reports the results of statistical tests that help evaluate the first aspect. It is evident that Italian regions have very different levels of irregularity.

Moreover post hoc tests, performed to verify means equality, showed that the average level of irregularity among regions is very different.

Figure 2 shows the box plots IWR for the 20 Italian regions, grouped by macro geographical areas. Once again, it's evident the heterogeneity of IWR distribution over regions.

These preliminary results clearly state that, whatever the model is, it has to take into account the specific regional effect on undeclared work. This is a well known approach and the literature on the topic measures the effects of socio-economic variables on regional irregular work using fixed effect models. A broader discussion on this point will follow up ahead in this section.

The main innovation of our contribution in model specification is that we use a dynamic panel rather than a static one.

Time plots in figure 3 show IWR dynamics and help out to understand this choice. Apart from a sudden decrease occurred around year 2001^f, lines are quite flat showing that IWR is a time-persistent phenomenon.

Therefore, the best way to model such behavior is through an autoregressive panel model.

Model specification is:

$$\ln \frac{IWR_{it}}{100 - IRW_{it}} = IWR'_{it} = \sum_h \phi_h IWR'_{i(t-h)} + \sum_{k=1}^q \beta_k X_{i(t-k+1)} + \nu_{it} \quad (1)$$

^fThis turning point is the effect of two amnesties on irregular immigrants: all at a sudden, a huge amount of irregular workers (the illegal immigrants) are declared and hired with a regular position.

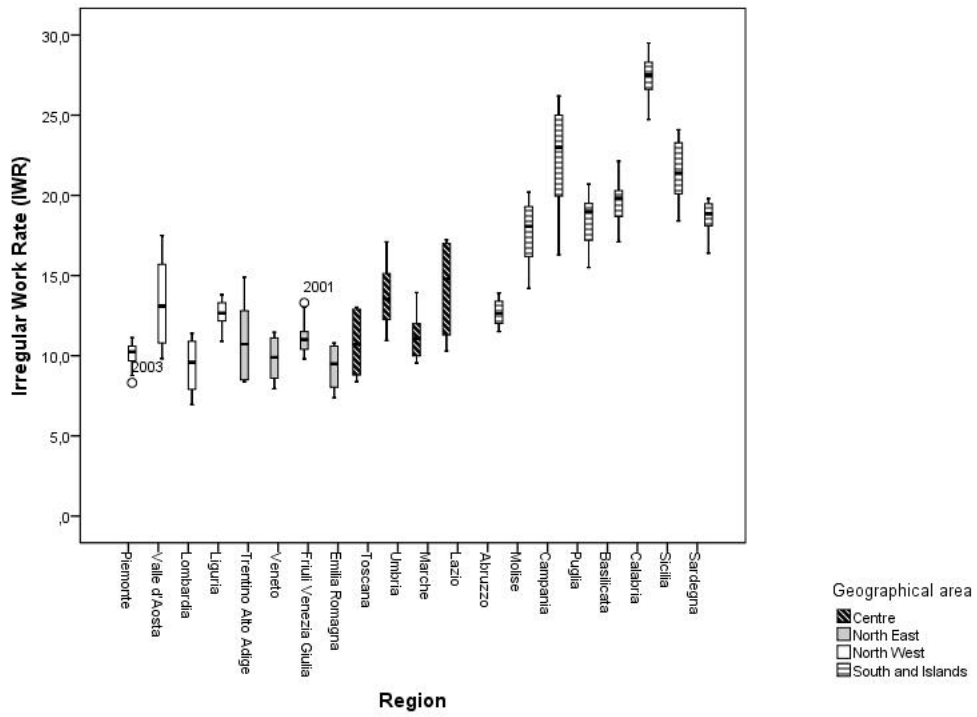


Figure 2: Box plot of IWR by regions.

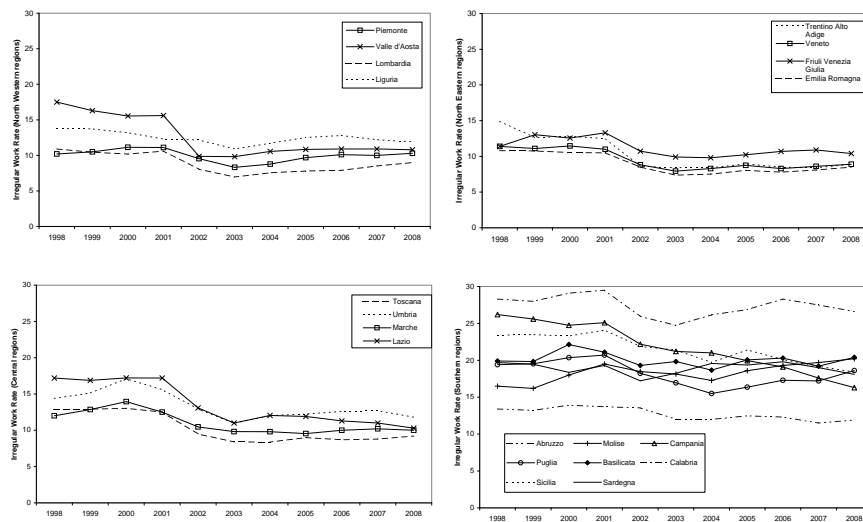


Figure 3: Undeclared work rate for Italian regions. Panels group regions belonging to the same geographical area; each line represents a regional time series. Years 1998-2008.

Where $i = 1, 2, \dots, 20$ and $t = 1, 2, \dots, 11$ are, respectively, regions and time indicators.

In the right end side of 1, the error term can be written as: $\nu_{it} = \mu_i + \epsilon_{it}$ where:

- μ_i is an unobserved and time-invariant variable, which differs among regions and captures the individual effect;
- ϵ_{it} is an unobserved time and individual variant variable, often referred as idiosyncratic error.

Another important issues to discuss is whether the individual effects μ_i are correlated to (some) explanatory variables X . If this is the case, then a fixed effect model is the appropriate choice. Otherwise, if correlation is absent, the best choice is a random effect model.

Due to the differences in the economic structure and on the culture of Italian regions it is much more likely to think of a correlation between μ_i and X . Furthermore, since we are inferring on regions, which cannot be considered as a random draw from a population, but are “one of a kind”, then the choice has to be on a fixed effect model.

Several problems may arise from estimating model 1: 1) some regressors X might be endogenous (unemployment rate) because causality is very likely to run in both directions; 2) as we said, there is a problem of correlation between the fixed effect and the explanatory variables; 3) lagged dependent variables give rise to residuals autocorrelation.

To cope with all these problems and to take into account the fact that $T = 11$ we used the Arellano-Bond estimator (9; 26).

In more details, we used a one-step system GMM estimation method, with small-sample adjustment. To avoid that heteroskedasticity might affect standard errors estimates, we used a robust estimation method for the covariance matrix. Model estimations were done using the command `xtabond2` in STATA 11 (36).

Model results are given in table 3.

Results clearly show that: a) irregularity in work is a persistent phenomenon as it emerges from the fact that lags of order 1 and 2 are both significant and the IWR_{t-1} coefficient is the highest among all estimated coefficients; b) social capital has a protection effect meaning that the more a region is organized under a social point of view and the deeper is the social responsibility and engagement among inhabitants, the lower is the propensity to hire irregular workers; c) unemployment favors irregularity; d) when model specification is dynamic, almost all of the variables listed at the beginning of this section are not significant.

Two major concerns arose with the estimated model: the first one refers to the possibility to have found an effect because social capital index include crime related variables and crime is strongly spread out in those regions where labor irregularity is high; the second concern is that the panel might have an unit root.

The first problem was tackled by checking model robustness to the definition of social capital index. To be more precise, we excluded the crime-related variables (i.e. Violent crime, Criminality risk perception, Criminal association, Mafia association) from SCI and used them as a control.

After rerunning the estimates, we found again that social capital has a significant effect of protection (its estimated coefficient was -0.711), whereas crime hasn't.

To cope with the second problem, we checked if the Arellano-Bond estimated coefficient for IWR_{t-1} was included between the OLS and the static panel fixed effect estimates. Since it was⁹, we excluded the existence of a unit root.

4. CONCLUSIONS

There is a widespread evidence that tax evasion cannot be entirely reduced by deterrence. Instead there are many other factors that explain tax compliance. We investigated the effect of social capital on a particular form of tax evasion: i.e. the one that allows employers to cut costs by hiding the true amount of gross wages due to employee and avoid the withhold of social security contributions.

We found a strong evidence that social capital prevents irregular work in the Italian regions. Like any forms of capital, social capital has to be fostered so as to offset depreciation: in particular we believe that its benefic effect relies on the stigmatization of deviant behavior inside a community with strong networking and structured norms. This mean that a country which is experiencing an impoverishment in morality will suffer, among others, of an increase of irregular work. In a recession period, like the one which is anguishing all developed economies, it can accelerate the vicious circle tax rise-recession-tax evasion-public deficit increase-tax rise.

As a consequence, it is of dramatic importance that policy makers are conscious of the beneficial effects of social capital and invest in favouring public confidence and social integration accordingly.

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⁹We verified that for both models (meaning those arising from the two definitions of SCI) no unit root exist.

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Table 1: Sub-dimensions of social capital and proxy indicators selected

Social behavior	
Violent crime (number of crimes per 10,000 inhabitants) ^a	
Criminality risk perception (rate of families perceiving criminality risk strongly or very strongly) ^a	
Common crime (as a % of all crimes) ^a	
Number of protests per 10,000 inhabitants ^a	
Number of fraud per 10,000 inhabitants ^a	
Criminal association (number of crimes per 100,000 inhabitants) ^a	
Mafia association (number of crimes per 100,000 inhabitants) ^a	
Social engagement	
Percentage of voluntary workers (at least 14 years old) in non-profit institutions ^a	
Social relationships	
Number of tickets sold for music and theater representations per 100 inhabitants ^a	Data
Number of suicides per 100,000 inhabitants ^a	
Civic responsibility	
Number of television subscriptions per 100 families ^a	
Percentage of voters at referendum ^b	
Territorial characteristics	
Percentage of resident population that moved out the region ^a	
Percentage of resident population that moved in the region ^a	
Resident population in the regional capital/resident population outside the regional capital ^a	

sources: ^a ISTAT; ^b Home Office;

Table 2: Results of some statistical tests on regional IWR behavior

Test	Type	Value of the test statistic	p-value	H_0
Kruskal-Wallis	χ^2	232.119	0.000	$Me_1=Me_2= \dots = Me_{20}$
Levene	Fisher's F	11.419	0.000	$\sigma_1^2 = \sigma_2^2 = \dots = \sigma_{20}^2$

Table 3: Results of the Arellano-Bond estimator for the dynamic panel model

<i>IWR_t</i>	Coef.	Std. Err.	<i>t</i>	<i>P</i> > <i>t</i>	[95% C.I.]	
<i>IWR_{t-1}</i>	0.961	0.055	17.400	0.000	0.845	1.077
<i>IWR_{t-2}</i>	-0.247	0.058	-4.280	0.000	-0.368	-0.127
<i>UnR_{t-1}</i>	0.014	0.004	3.550	0.002	0.006	0.022
<i>SCI_t</i>	-0.640	0.225	-2.850	0.010	-1.110	-0.170
<i>cons</i>	-0.373	0.126	-2.970	0.008	-0.636	-0.111

Instruments for first differences equation

GMM-type (missing=0, separate instruments for each period unless collapsed)

(*IWR_{t-1}* *IWR_{t-2}* *SCI_t* *UnR_{t-1}*) collapsed

Arellano-Bond test for AR(1) in first differences: $z = -3.36$ $Pr > z = 0.001$

Arellano-Bond test for AR(2) in first differences: $z = -0.17$ $Pr > z = 0.866$

Sargan test of overid. restrictions: $\chi^2_7 = 10.56$ $Prob > \chi^2 = 0.159$

Hansen test of overid. restrictions: $\chi^2_7 = 6.22$ $Prob > \chi^2 = 0.514$

Difference-in-Hansen tests of exogeneity of instrument subsets:

GMM instruments for levels

Hansen test excluding group: $\chi^2_3 = 4.63$ $Prob > \chi^2 = 0.201$

Difference (null H = exogenous): $\chi^2_4 = 1.59$ $Prob > \chi^2 = 0.811$