



# Down and out in Italian towns: Measuring the impact of economic downturns on crime



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## HIGHLIGHTS

- The paper investigates the causal impact of economic downturn on crime, focusing on the Italian case.
- The Downturns led to significant increase in economic-related offenses which require low criminal skills.
- Non-economic crimes, such as murders, are not influenced by economic fluctuations.

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## ABSTRACT

The paper investigates the effect of local economic conditions on crime. The study focuses on Italy's local labor markets and analyzes the response of crime to the severe slump of 2007–2011. It shows that the downturn led to a significant increase in economic-related offenses that do not require particular criminal skills or tools (namely, thefts).

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## 1. Introduction

Anecdotal and empirical evidence suggests that the economy is an important determinant of crime (Box and Hale, 1982; Gould et al., 2002a,b). In economic models of crime such as Becker's (1968), a declining economy provides higher incentives for individuals to commit offenses. This prediction is likely to be more applicable to crimes with direct financial motives, such as thefts, but less important for non-economic-related crimes (such as homicides and sexual offenses) that are affected by a completely different set of determinants (Machin and Meghir, 2004; Edmark, 2005). As Mustard (2010) maintains, the empirical results fail to support

consistent evidence in favor of the link between slowdowns and illegality. Among the possible reasons, the author highlights that countervailing forces could play a role: a shrinking economy might provide greater incentives for people to substitute the legal labor market with the illegal one, but might also imply that fewer resources are available for criminals to steal. Furthermore, the number of *victimless* crimes, such as drug dealing or gambling, tends to be a function of customer demand, which may well decrease during economic downturns (Freeman, 1999). However, the failure could be also related to pitfalls in empirical strategies. Only recently the empirical literature has started to tackle seriously the threats to identification that might arise. Omitted variables, reverse causation and measurement issues can be jointly tackled with IV strategies (Mehlum et al., 2006; Gould et al., 2002a).

This paper assesses the causal impact of local economic downturns on variations in criminal activity. It focuses on Italy

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and concentrates on recent developments—namely, an economic crisis of unprecedented gravity since the Great Depression. Since the international crisis in Italy has brought about not only cross-time volatility, but also high levels of sectoral and geographical variability in economic activity, there is enough variation across local areas to identify the effect of the crisis on crime, isolating it from many other confounding factors.<sup>1</sup>

## 2. Data and method

We address the impact of the economy on crime using the following specification:

$$CRIME_{i,t} = \alpha + \beta ECONACT_{i,t-1} + \sum_n (\delta_n X_{i,t}) + \gamma_i + \rho_t + \varepsilon_{i,t} \quad (1)$$

where  $i$  indexes spatial units and  $t$  years;  $CRIME$  denotes the number of illegal acts of a given type (i.e., thefts) while  $ECONACT$  is a proxy of local (private) economic activity in the area.<sup>2</sup> Our analysis is based on a panel (2004–2011) with area ( $\gamma_i$ ) and time ( $\rho_t$ ) fixed effects. Importantly, area fixed effects absorb the effect of all time-invariant local factors, including the size of the local areas.  $X_{i,t}$  indicates time-varying covariates at the chosen level of geographic aggregation. As for the latter, we include the total number of native and foreigner population. Moreover, we allow each control to have a different confounding impact on crime.<sup>3</sup> Identification comes from within-area overtime lagged correlation between economic conditions and crime. All the variables we use are taken in logs.<sup>4</sup> Thus, the coefficient  $\beta$  approximates the elasticity of crime to the economic conditions in the preceding year.<sup>5</sup>

Identification challenges are tackled by adopting as instrument, the “shift-share” estimation of economic activity, which is computed as the sum of the contemporaneous nationwide employment variation by sector, weighted by the sector share in local employment in 2001:

$$INST_{i,t-1} = \sum_k (\text{emp}_{n,k,t-1} * \text{share}_{i,k,T} / \text{emp}_{n,k,t-2}) \quad (2)$$

where  $j$  refers to local areas,  $t$  to year,  $T$  to the year 2001,  $n$  to the nationwide value, and  $k$  to sectors.

The instrumental variable is a derivation of the shift-share approach introduced by Bartik (1991) and Blanchard and Katz (1992), and used extensively by Moretti (2010), Gould et al. (2002b) and Fougere et al. (2009). The validity of the instrument relies on the fact that national shocks to individual sectors impact the local economies proportionally to the employment shares of those sectors in total employment. The crucial assumption for the validity of the exclusion restriction is that both the sectoral composition of the local economy in year 2001 and the nationwide shocks do not have any independent effect on the dependent variable.

Two other aspects need deeper consideration. Firstly, the analysis employs a more suitable spatial classification than the bulk of

the previous work on the subject. The geographic units of reference are the local labor markets (LLMs), which are functional areas defined as groups of municipalities interconnected by large commuting flows.<sup>6</sup> Data at the local level delivers substantial benefits in the empirical strategy, as “national or state-level data mask much of the important variation that is needed to identify causation” (Mustard, 2010). Using areas defined on the basis of labor market interactions represents an appropriate methodology for answering the research question, i.e. the degree to which criminal activities substitute legal labor market opportunities. Secondly, the study takes advantage of a *unique* dataset on criminal acts. The dataset employed is the Investigation System (IS), available at the municipality-level for the years 2004–2011 and including 34 sub-categories of crime. This dataset collects information on victim reports gathered during day-by-day investigations into criminal activity by police departments.<sup>7</sup> Therefore, crime data are less biased by the underreporting issue that hinders the empirical analysis of crime. Along with the LLM and year fixed effects present in all our specifications,<sup>8</sup> the exhaustiveness of the data guarantees that there is no systematic measurement error in the dependent variables.

The measure adopted to assess the local state of the economy is the sum of the sales generated by all company plants (belonging to private firms) located in the LLM. The variable is obtained from the commercial archive Cerved, containing detailed balance sheet information on all Italian corporations. We use Cerved data because labor surveys are not reliable at the LLM level.<sup>9</sup> Compared to labor force survey data, balance sheet data are *less* informative with reference to the labor status of the residing population. However, balance sheets are *more* informative with respect to labor market deterioration that does not lead to unemployment (i.e. resulting only in wage losses due to reduced working hours).<sup>10</sup> Moreover, the standard unemployment rate fails to consider non-participation issues (Bank of Italy, 2010).<sup>11</sup>

## 3. Empirical results

Table 1 presents the results obtained by using the number of different types of crime at LLM level reported in the IS as dependent

<sup>6</sup> Local labor markets are defined by the Italian National Institute of Statistics (ISTAT, 1997). They are aggregations of two or more neighboring municipalities based on daily commuting flows from place of residence to place of work as recorded in the 2001 Population Census. Local labor markets are thus largely “self-contained”: within a given unit, both the share of working residents working locally and the share of employees residing locally must be at least 75%.

<sup>7</sup> IS data are confidential. They were made available to the staff of the Bank of Italy within a joint Bank of Italy–Ministry of Interior project on crime and the economy.

<sup>8</sup> The LLM and year fixed effects absorb the local and temporal component of underreporting. For further information see: Bianchi et al. (2012).

<sup>9</sup> Labor force survey (LFS) data released at LLM level present large standard errors due to the small sample size of the underlying surveyed population. Furthermore, the LFS in Italy is stratified at regional level; LLM are much smaller than regions, on average, and can cross regional borders. These factors add further noise.

<sup>10</sup> This may be particularly important in Italy, where the network of “family insurance” often replaces a formal system of unemployment benefits (Saraceno, 1994). As a consequence, the shrinking of a single wage may have major repercussions on the well-being of several related individuals.

<sup>11</sup> Even though we consider firm data, the economic mechanism behind our results is essentially a labor market one. In the working paper draft of our study (see: <https://www.bancaditalia.it/pubblicazioni/temi-discussione/2013/2013-0925/index.html?com.dotmarketing.htmlpage.language=1>) we provide additional evidence in this regard, showing that in those LLMs where labor market channels slowed down the impact of the recession (because of the availability of wage supplementary schemes and/or pro-worker contractual arrangements) the estimated impact on crime is lower.

<sup>1</sup> For instance, a Collective Clemency Bill passed by the Italian Parliament in July 2006, which led to the early release of a large share of detainees.

<sup>2</sup> Since we include time dummies, the measure of economic activities is left in nominal terms. Only the count of criminal acts are available in the source data, although the value would provide more relevant information.

<sup>3</sup> This is probably an unnecessary precaution, since previous literature suggests that there is no causal impact of the growth of non-native population on crime: see Bianchi et al. (2012).

<sup>4</sup> For crime events, we add one to all observations in order to keep zeros in the sample.

<sup>5</sup> We lag both the instrument and the endogenous independent regressor to further strengthen the exogeneity of our instrument, though our results are consistent in terms of sign and statistical power when fitting concomitant explanatory variable and instrument.

**Table 1**

The effect of economic activity on crimes, OLS and second-stage IV.

Source: Authors' elaborations on ISTAT, CERVED, and IS database.

Variables	(1) Thefts (ln) OLS	(2) Thefts (ln) IV	(3) Robberies (ln) OLS	(4) Robberies (ln) IV	(5) Murders (ln) OLS	(6) Murders (ln) IV	(7) Drug (ln) OLS	(8) Drug (ln) IV
ECONACT (lag)	0.051 (0.060)	−0.456** (0.225)	0.023 (0.056)	−0.594 (0.414)	−0.010 (0.028)	0.199 (0.424)	0.056 (0.059)	1.236** (0.534)
Native (ln)	0.161*** (0.040)	0.279*** (0.075)	0.134* (0.056)	0.278* (0.118)	0.034 (0.053)	−0.015 (0.115)	−0.039 (0.064)	−0.315** (0.148)
Foreigners (ln)	0.006 (0.143)	−0.260* (0.140)	−0.079 (0.106)	−0.402 (0.253)	0.021 (0.066)	0.131 (0.234)	0.035 (0.114)	0.653 (0.394)
LLM FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4732	4732	4732	4732	4732	4732	4732	4732
Number of LLM	683	683	683	683	683	683	683	683
<b>First-stage</b>								
INST (lag)		4.868*** (1.173)		4.868*** (1.173)		4.868*** (1.173)		4.868*** (1.173)
F-statistic excl. IV		16.92		16.92		16.92		16.92

Notes: The unit of observation is the Local Labor Market (LLM). All variable are in logs. Robust standard errors clustered at LLM level in parenthesis. The *F*-statistics reported in the First-stage results is the outcome of a test of significance of the excluded instrument. The first-stage regressions also include the same set of controls and fixed effects included in the main specifications.

\* Significant at 10%.

\*\* Significant at 5%.

\*\*\* Significant at 1%.

variables.<sup>12</sup> In column 1, we consider theft as a dependent variable. The OLS estimates suggest a positive, but statistically insignificant, correlation between the local economic downturn and economic-related crimes. In column 2, instrumental variable estimates reveal that an increase in economic activity reduces the number of thefts in the LLM, i.e. the impact of the economic downturn on thefts is positive.<sup>13</sup> The magnitude of the effect is substantial: a 1% decrease in economic activity is linked to an increase of about 0.45% in thefts. The estimated elasticity implies a sizable impact on the different percentile of the distribution. For example, it suggests that moving from the LLM at the 75th percentile of the distribution of the variation in economic conditions in year 2009 to the LLM at the 25th percentile leads to an increase in stealing by around 7.65%.<sup>14</sup> The *F*-test of the null hypothesis on the excluded instrument in the first stage of our IV estimate is equal to 16.92, thus validating the strength of the instrument.

Columns 3–4 show the relationship between robberies and economic downturn. Crimes involving robbery represent a poor alternative for those who experience economic difficulties. Legally, robberies are identified as offenses for which goods are taken away from the victims by a physical act of violence, involving weapons in most cases. Compared to thefts, robberies require more crime-specific human and physical capital. Therefore, they are less appropriate than thefts as short-run criminal alternatives for those who act out of necessity. As reported in column 4, the impact of a local economic downturn on the number of robberies is positive but insignificant. While the sign suggests the possibility for a correlation between disadvantaged local economic conditions and robberies, the lack of significance in the estimated coefficient

implies that this type of crime is less suitable for “occasional” criminals acting out of necessity.

Columns 5–6 provide the results for murders. This experiment was intended to corroborate previous findings. First, murders are arguably weakly dependent on short-term changes in economic conditions, largely owing to the multiple factors influencing this criminal act; second, they are generally associated with psychological characteristics and skills (e.g. using a weapon) which are unlikely to change in the short-term. Therefore, if economic activity was found to be correlated to homicides where no relationship is expected, it would indicate that the model failed to account for other confounding effects (for instance, a surge in crime due to cultural factors unrelated to the concomitant downturn). This does not appear to be the case as the results from Column 5–6 indicate that the economic downturn does not affect the level of homicides.

Finally, in columns 7–8 we investigate whether number of drug-related crimes are influenced by the economic crisis. As emphasized by Freeman (1999), following market principles, if one assumes as constant the risk associated with drug-related activity, the expected return from engaging in illicit activity will be higher in more prosperous areas. Result of our estimates support this mechanism in the Italian case. Specifically, we find that drug-related crimes experienced a sudden drop during the economic crisis, with a decrease of 1% in economic activity associated with a high level of elasticity (−1.2%) in drug crimes.

#### 4. Conclusions

As featured in the *Handbook on the Economics of Crime* (Benson and Zimmerman, 2010), there is a gap between the theoretical claim that economic conditions have an impact on crime and the supporting empirical evidence. By exploiting the severe slump of 2007–2011 and making use of a number of technical advancements (i.e. highly-disaggregated spatial units, more reliable data on crime, an identification strategy that is suited to deal with threats to causality) this paper helps fill that lacuna.<sup>15</sup>

<sup>12</sup> We also run regressions using a slightly different specification for the dependent variables. We take the local number of crimes divided by the population (at the same time, we do not include population measures on the LHS). The results of these experiments, not reported but available from the authors, are very similar to those illustrated below.

<sup>13</sup> IV estimates are consistent when considering alternative approaches for the construction of the instrument, as for example when using the natural log of the variation or the first difference of the natural log (available upon request).

<sup>14</sup> Between 2008 and 2009, the economic activity of the LLM at the 25th percentile shrunk by 20%, while those of the LLM at the 75th percentile contracted by 3%. The difference between the two growth rates is therefore 17%.

<sup>15</sup> Interestingly, previous empirical studies for Italy focusing on different spatial units, data, and time periods, produce rather different results (e.g. Buonanno, 2006).

This article finds that in Italy's local labor markets thefts significantly increased as an effect of the downturn. Compared to offenses that are easy-to-commit by those less equipped with criminal expertise, economic-related offenses that require some crime-specific human and physical capital, such as robberies, are not affected by the crises. Non-economic crimes, such as murders are not influenced by economic fluctuations. Additionally, our analysis confirms a positive correlation between drug-related crimes and economic activity.

The idea that economic slumps jeopardize the safety of a population is of growing concern to governing authorities. Our estimates therefore contribute to informing the fight against crime. Overall, the findings suggest that national and local authorities should add criminality to the long list of social problems that require attention during an economic crisis. However, they also offer a more nuanced insight into the dynamics of economic-related crime by highlighting how crisis-related surges in criminal offenses are limited to unskilled criminal activities, i.e. thefts. This suggests that policy responses stand a higher chance of success if they are tailored to the types of offenses expected to interact with the downturn and the features of the local economy.

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