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The impact of crime on firm entry

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ABSTRACT

The article investigates the effect of crime on firm entry rates in Italian provinces over the period 2007-2016. The extant literature focuses mainly on the relationship between crime and the sorting of new businesses. The present paper contributes to this stream of work by estimating the effect of crime on the overall propensity to engage in entrepreneurial activities across a national territory. We measure the extent to which property and violent crime affect firm entry rates using an instrumental variable approach in which the instrument for criminal activity is the effective abortion rate. Our findings suggest that crime has a negative, sizable impact on firm entry. The results are robust to alternative instrumental variables and firm entry indicators. This empirical exercise emphasises the need to consider loss of new business activities as a downstream effect when computing the social costs of crime.

Keywords: Criminal activities; Firm entry; Entrepreneurship; Abortion rates; Property and violent crimes

JEL: K42; L26; R11.

1. Introduction

Since the seminal work by Becker (1968), several studies have investigated the economic causes of criminal activity and the most effective policy measures to tackle crime rates

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(see, e.g., Machin & Meghir, 2004; Levitt, 2004). However, the literature pays less attention to the consequences of crime than to the factors that influence criminal choices and behaviour (Rosenthal & Ross, 2010). Crime has long been recognised as a cost to society (Chalfin, 2016). First, it generates external costs, that is, the amount of resources at which individuals are indifferent about being victimised or not (e.g., the value of the stolen items, the time required to buy new goods, etc.) (Heeks et al., 2018). Second, criminal activity is associated to social costs that affect welfare gains and economic performance for the whole society (Lee & Fisher, 2019). These social costs are related to the more productive use of the resources employed to prevent criminal activity (e.g., the police, prisons, etc.) (e.g. Morris and Tweeten, 1971; Atkinson et al., 2005) and the downstream effects on, for instance, per capita income growth (Peri, 2004), commercial property values (Lens & Meltzer, 2016); foreign direct investment (Daniele and Mariani, 2011), productivity (Powell et al., 2010), loan interest rates (Bonaccorsi di Patti, 2009), economic diversification (Ríos, 2016), etc.

The present article contributes to the debate on the social costs of crime by analysing the downstream effect that crime exerts on the propensity to engage in entrepreneurial activities. New ventures are vehicles of technological change and economic growth and are the main source of (net) job creation (Decker et al., 2014; Criscuolo et al., 2014). However, only few works investigate the relationship between crime and new business creation. This small stream of research mostly examines the effect of crime on the sorting of new firms and posits that criminal activities affect decisions about *where* among different city neighbourhoods to locate the new business. The effect of crime on the initial decision to start a new business tends to be ignored.

The primary goal of the present article is to contribute to the literature by exploring whether and to what extent criminal activity affects firm entry rates in the Italian provinces. We expect crime to have a negative impact on the overall firm entry rate due to the tangible and intangible costs of crime in the form respectively of direct damage (e.g., stolen equipment) and a reduced customer base due to fear of crime (Kuratko et al., 2000; Bowes, 2007) which affect small firms disproportionately. By definition, new ventures are small, thus, high levels of crime translate into a higher probability of incurring in these additional costs. Moreover, crime increases economic uncertainty and inefficiency (Detotto & Otranto, 2010).

An entrepreneur is an economic agent that makes judgements about how events will unfold and the consequences for realizing some profit from its entrepreneurial actions (e.g., Hastie, 2001; Hebert & Link, 1989). Therefore, environmental uncertainty can lead to procrastination and disinvestment (Dixit et al., 1994) and a reduced probability of exploiting an entrepreneurial opportunity (see, e.g., McMullen & Shepherd, 2006). Similarly, inefficiencies in the functioning of the economy, such as authority abuses or a disorganized markets, lead to higher agency and transaction charges which represent a cost for the entrepreneurial activity (Casson, 1982; Anokhin & Schulze, 2009). Formally, we follow the theoretical framework provided by Melitz (2003) (see also Mahofa et al., 2016), where firms' entry choice is contingent on the level of expected discounted

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profits. Since the model incorporates firms' heterogeneity in productivity, it states that there exists an entrepreneur-level cut-off productivity threshold above which the new firm covers the production and entry costs and successfully produce. However, crime influences the expected profits raising the productivity threshold that is required to enter the market and, thus, selecting only those would-be entrepreneurs whose variable profits exceed the costs of entry. Therefore, crime has a negative effect on overall entry via both an increase in production costs and a decrease in revenues. In other words, crime reduces the probability that the individual will exploit an entrepreneurial opportunity due to its negative effect on expected profits (Baumol, 1990; Baker et al., 2005). Accordingly, crime increases the opportunity costs of starting a business (Matti & Ross, 2016): all other individual characteristics being equal, crime can be expected to reduce firm entry rates by decreasing the utility function of the would-be entrepreneur.

Assessing the relationship between crime and firm entry is complicated for several reasons. First, there is the pervasive problem of simultaneity bias. The most common finding in the empirical literature is that criminal activity is associated positively to firm entry. Rosenthal and Ross (2010) investigated whether violent crime affected where businesses locate, in the case of five US cities; they found that entrepreneurial activities in both wholesale and retail industries tended to locate in high-crime areas. They found, also, that the retail to wholesale proportion diminished moving from low- to high-crime level areas, suggesting that crime affects new business location, especially for those economic activities particularly sensitive to customer proximity. However, in a second exercise, they found that the number of restaurants in a census tract was associated positively to the presence of violent crime and concluded that there is "an endogenous sorting of restaurants into unsafe areas" (Rosenthal and Ross, 2010, p. 145). Sloan et al.'s (2016) study of the relationship between criminal activities and entry of restaurants in small parcels in Memphis (US) confirm this result. Their findings point to a positive and significant relationship between various typologies of violent crime and the number of new restaurants. They concluded that the amenities characterising high-crime small parcels outweighed the negative effects of the criminal activities. Similar evidence is provided by Bowes (2007), who shows that crime exerts a negative effect on retail developments, but that, at the same time, these developments also attract criminal activity. These findings highlight that while crime may affect where new firms locate, a high number of (new) businesses is likely to attract criminals due to resources abundance (Glaeser & Sacerdote, 1999). Therefore, the finding of no impact of crime on firm entry or of a positive association, could be the result of biased estimation rather than being a robust causal effect. Greenbaum and Tita (2004) adopt a quasi-experimental approach to investigate whether a shock in the form of incidents of violent crime alters the probability of new venture location in five large US cities between 1987 and 1994. Their results suggest that a surge in violent crime in a particular Zip-code has a negative effect on the firm entry growth rate. However, the effect is statistically significant only for business services that locate in initially low-crime level areas.

A second challenge in estimating the relationship between crime and firm entry is the problem of omitted variables. Confounding socio-economic and demographic factors affect both criminal activity and number of entrants, leading to biased estimation of the effect of the former on the latter. For example, Garcia (2014) shows that the significant relationship between crime and the rate of entry in European cities vanishes if country fixed effects are included in the empirical estimation. Apart from those variables that can, in principle, be controlled for (e.g., agglomeration economies, population, etc.), it is difficult to account directly for some specific characteristics of local areas. For instance, a high rate of unemployment may be associated positively to firm entry (Storey, 1991; Santarelli et al., 2009) and, also, may favour the presence of illegal activities (Raphael & Winter-Ebmer, 2001).

The third issue is measurement error related to capturing the number and the perception of criminal activities by potential entrepreneurs. Crime tends to be measured based on official statistics on the criminal offences reported to the police. However, some crimes may go unreported, which would lead to underestimation of the number of crimes in the area (Skogan, 1975; Pepper et al., 2010).

The present paper seeks to identify the effect of crime on firm entry, accounting for the sources of endogeneity – simultaneity, omitted variables and measurement error – that usually affect empirical studies on the topic. We rely on an instrumental variable approach, using data on abortion rates and police expenditure as instruments for crime. We conduct a first exercise in which we only rely on criminal activity as instrument. The effective abortion rate is an attractive instrument as there is convincing evidence that it is correlated negatively to criminal activity. Donohue III and Levitt (2001) suggest that legalised abortion exerts a negative impact on crime rates via two effects. On the one hand, the cohort-size effect has an impact on crime by reducing fertility rates: holding the number of pregnancies constant, when the affected cohort reaches the years of highest-criminal activity, potentially, fewer people will engage in criminal activity. On the other hand, there is a reinforcing selection effect which relies on the higher likelihood of a child born after abortion was legalised, being wanted. Legalising abortion allows women to optimise the timing of their pregnancies and to delay childbearing in the case of suboptimal conditions (e.g., drug abuse, poverty, etc.). Given that abortion disproportionately affects disadvantaged socio-economic and specific demographic groups and since unfavourable economic conditions may increase the attractiveness of crime as an alternative source of income (Becker, 1968), children who are wanted should be less likely than unwanted children to engage in criminal activities.

Moreover, abortion does not have a direct effect on the number of new firms. If we examine the demographic characteristics of entrepreneurs, we observe that young people are more likely to be involved in criminal activity but are much less likely to become entrepreneurs— in particular, founders of limited companies. We exploit this characteristic and test the robustness of our results by focusing on cohorts who would have reached the age of criminality (but not the most likely age to become an entrepreneur) during the period of analysis, had abortion not been legalised.

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As a second exercise, we identify an additional instrument for criminal activity. There is a trade-off between using one or multiple instruments for one endogenous variable.¹ We employ police expenditure as second, additional instrument. A variety of works provide evidence of the link between crime and police, where higher level of police leads to lower level of crime (Levitt, 1997; Evans and Owens, 2007; Mello, 2019). Conversely it is also acknowledged that the link between police and entrepreneurship is mediated by the effect that police exert in terms of higher safety (Ostrom, 2005), so to say the only mechanisms by which police influence entry rate is through its reduction of criminal-related activities. By instrumenting criminal activity with both abortion rate and policy expenditure we therefore aim at increasing the efficiency of the instrumental variable approach and further support our conjecture of the presence of a negative effect of crime on the rate of entry.

Our paper exploits an original dataset of 103 Italian provinces during the period 2007-2016 and finds that criminal victimisation has a negative effect on firm entry. We show that the empirical strategy adopted has a strong influence on the sign, significance and size of the coefficient of the crime variable.

The paper is structured as follows. Section 2 and 3 describe the dataset used for the empirical analysis and the empirical strategy. Section 4 presents the results and the robustness checks and Section 5 concludes the paper.

2. Data

We build a province-level (Nuts III regions according to the European nomenclature) dataset for the period 2007-2016, combining information from different sources. First, data on firm entry are obtained from the Movimprese archive (www.infocamere.it), which collects data from the Italian Chambers of Commerce on the number of new companies registered per year in each Italian province. The proposed analysis includes limited companies and self-employment, which represent the vast majority of the registered firms in the dataset. This source of data also enables us to investigate the effect of crime on entrepreneurship within industries that have been previously analysed by in the related literature (Rosenthal and Ross, 2010) such as retail and wholesale activities and restaurants – together with total firm entry in the province. Second, we exploit data provided by the Ministry of the Interior on criminal activity in different crime categories. Finally, our dataset includes socio-economic data obtained from the Italian Office of

¹ The advantage of using one instruments rests mostly in the satisfaction of the exclusion restriction, as it is usually easier to justify only one rather than two instances by which the instruments is exogenous to the dependent variable. Conversely adopting multiple instruments have the advantage of increasing the precision of the marginal effects, therefore it augments the efficiency of the estimation (e.g. Hansen et al., 2008), at the expenses of increasing bias and the probability of the instruments being correlated with the error term.

National Statistics (ISTAT) on population, per capita income, employment rates and growth in the number of active firms.

For what concern the information on our instrumental variables, data on abortion also come from ISTAT. Abortion became legal in Italy in 1978 and applied to public and private institutes. It enabled a woman to end a pregnancy during the first 90 days of gestation. Data on abortion at the province level are available from 1980 onwards. Section 3.1 describes how we built our instrumental variable, using historical data on abortion since legalisation. However, during this period, Italian province borders changed as the result of two reforms, in 1990 and 2001, which led to the generation of new provinces (Palombelli, 2012). These changes required us to geo-localise the whole dataset according to the historical province borders in 1980. Conversely data on policy expenditure are collected from the Ministry of the Interior at the municipality level and then aggregated at province level.

Figure 1 depicts the geographical distribution of firm entry rates and shows that the number of new firms per hundred thousand inhabitants is concentrated in the north-centre of Italy. In particular, Tuscany and the southern part of Emilia-Romagna, include clusters of higher entry rates. Also, while provinces in the centre east and west coast areas exhibit higher rates of firm entry, provinces in the south and north-east are lagging.

Figure 2 depicts the geographical crime rate distribution in Italy during 2007-2016. The statistics account for province size in terms of people aged between 15 and 74 years. It is worth noting that crime is concentrated in the north-west (especially Piedmont) and the Po Valley – Lombardy and Emilia-Romagna. As expected, the bigger regional capital cities (i.e., Rome, Naples, Bari) are included in the top quintile of the property crime distribution.

3. Empirical strategy

We model the relationship between crime and firm entry as follows:

$$ENTRY_{it} = \alpha + \beta CRIME_{i,t-1} + \gamma X_{i,t-1} + \delta_i + \tau_t + \varepsilon_{it} \quad (1)$$

where *ENTRY* captures the number of new firms or, alternatively, the number of new businesses over registered firms in the previous year (see, e.g., Audretsch & Fritsch, 1994) in province *i* at time *t*. *CRIME* is our main explanatory variable and measures criminal activity per 10,000 inhabitants for each year and province. The variable includes homicide, attempted murder, sexual assault, robbery, theft (i.e., commercial theft, burglary, etc.), exploitation, money laundering, cyber fraud and receipt of stolen goods.

We also include a set of time-varying controls, *X*. Together with the usual set of controls, such as per-capita income which account for province size and economic performance,

we consider the need to start a new business by controlling for the unemployment rate.² We control, also, for growth in the number of active firms in the province and for mafia infiltrations measured using the number of municipalities dissolved for mafia. Finally, δ_i are province fixed effects, which capture time-invariant idiosyncratic features of Italian provinces, and τ_t accounts for unobservable heterogeneity which is constant across cross-sectional units, but is time variant. All the variables are taken in natural logarithms, thus, our parameter of interest, β , approximates the elasticity of firm entry to criminal activity.

3.1 Endogeneity

A major issue in the estimation of the proposed model is the potential endogeneity of crime. The inclusion of province and time fixed effects and a full set of controls only partially addresses this issue; simultaneity bias, omitted variable bias and measurement error related to capturing criminal activity, could all be sources of endogeneity. Since our aim is to measure the effect of crime on firm entry rates across the whole Italian territory, we adopt an instrumental variable approach in order to identify the effect of interest. This could provide valuable implications for policy concerning the impact of potential institutional interventions on firm creation. In our empirical analysis, we propose a first identification approach which instruments crime with the effective abortion rate after the 1978 Law 194 which legalised abortion in Italy (Naddeo, 2017), and a second approach based on multiple instruments in which crime is instrumented with both abortion rate and police expenditure.

3.1.1 Abortion rate

The theoretical framework for the relationship between abortion and crime was proposed by Donohue III and Levitt (2001). Legalised abortion leads to a decrease in number of the cohort of individuals reaching the age of criminality (e.g., teens, early twenties), resulting in potentially fewer people engaging in illegal activities. In addition to this “cohort size” effect, Donohue III and Levitt (2001, p. 381) stress that “women who have abortions are those most at risk to give birth to children who would engage in criminal activity”. This “selection” effect is based on the fact that individuals seeking abortion are mostly teenagers or unmarried and economically disadvantaged women (Levine et al., 1999), who have a higher likelihood of giving birth to children at a higher risk of involvement in criminal activity (Comanor & Phillips, 2002). Also, legalised abortion allows for timing optimisation and gives the opportunity to postpone childbearing to wait for a better nurturing environment.

We measure the effective abortion rate as follows:

$$EFFECTIVEABORTION_{it} = \sum_a Abortion_{i,t-a} \left(\frac{Arrest_a}{Arrest_{tot}} \right) \quad (2)$$

² There is substantial debate in the literature on firm creation over the difference between opportunity to and the need to start a business (see, e.g., Wennekers et al., 2005; Fairlie & Fossen, 2018).

where a is the age of the cohort. *Abortion* is the number of voluntary abortions per live births in province i at time t . The abortion rate in each cohort is weighted by the share of arrests in the age cohort at the national level.³ This enables us to account for the age profile of the criminals.

Voluntary abortion is distributed unevenly across the Italian territory. Figure 3 shows that the number of voluntary pregnancy terminations per live births over the period 2007-2016 was particularly high in Emilia-Romagna, Tuscany, Piedmont and Val d'Aosta. It shows, also, that provinces in the north-east of Italy are generally in the median or lower quintiles of the voluntary abortion distribution and that the south of Italy is characterised by two opposite patterns. Some southern Italian regions have high levels of voluntary pregnancy terminations, for example, Apulia and Campania, while others, such as provinces in Calabria and Sicily regions, show very low levels of abortion.

3.1.2 Police expenditure

For what concern the second instrument, police expenditure, a variety of works investigate the link between criminal activity and policy force. Empirical evidence tends to be consistent in finding the level of police enforcement to reduce criminal intensity. Levitt (1997) study the change in police force following city mayoral elections willing to reduce criminal activities and identifies that police force enlargement produces a sizable reduction in crime rates. Evans and Owens (2007) and Mello (2019) investigate the effect of police force on criminal activities by exploiting the enforcement of two different public programs: results are robust to the detrimental effect of police on crime. Further works investigate the effect of police increase after violent crime surge, such as the terrorist attack in Buenos Aires (Di Tella and Schargrotsky, 2004) or in London (Draca et al., 2011) and find again important benefits of the police redeployment in particular area in respect to criminal activities in that area. Blesse and Diegmann (2022) moreover find that centralisation of police stations undertaken in order to reduce police expenditures increase the number of theft and burglary in residential areas that suffered the police stations closure. The relationship under study with respect to the Italian case is rather scant, however it points to very similar results to the one found with respect to the US (Buonanno and Mastrobuoni, 2012). We exploit police expenditure as second instrument to check whether the inclusion of multiple instruments affects our results. Indeed, we expect police expenditures to be correlated with crime (as stressed above) and not directly connected with firm entry since they exclude expenditures for private security services.

3.2 First stage equations

In the following analysis we provide results by estimating two alternative empirical specifications. First, we exploit variation in the effective abortion rate in Italian

³ Law 194 was implemented in May 1978, therefore, the first available full year was 1979. However, data availability means that the 1980 cohort is the first we can consider. Therefore, the oldest aged cohort considered in this empirical exercise includes those who would have been born in 1980 had legalised abortion not been introduced.

provinces. Second, we test whether including an additional instrument affects our results by adding police expenditure.

Both our instruments are found by the literature to be negatively related to our endogenous variable. We therefore expect our first-stage equation, either with only effective abortion rate, or with both abortion rate and policy expenditure as explanatory variables, to report negative coefficients for our instruments. Formally the first-stage equations are as follows:

$$CRIME_{it} = \alpha + \beta_1 EFFECTIVEABORTION_{it} + \gamma X_{it} + \delta_i + \tau_t + \varepsilon_{it} \quad (3)$$

$$CRIME_{it} = \alpha + \beta_1 EFFECTIVEABORTION_{it} + \beta_2 POLICE_EXP_{it} + \gamma X_{it} + \delta_i + \tau_t + \varepsilon_{it} \quad (4)$$

where *CRIME* captures criminal activity in province *i* at time *t*. The key variables of interest are *EFFECTIVEABORTION* and *POLICE_EXP* which measures the effective abortion rate as in equation 2 and police expenditure as described in Section 3.1.2. The model includes a set of control variables that are province and time varying, and province and time fixed effects.⁴ Table 2 reports the results of the model estimations. The coefficients of effective abortion rate and of police expenditures are statistically significant across all model specifications. It is worth noting that the pooled OLS reports a positive correlation between the two variables and crime rates. However, by adding the controls and fixed effects the relationship turns negative – a pattern that we will appreciate across all the regressions discussed later.

4 Results

4.1. The effect of crime on entrepreneurship

We now turn to the presentation and discussion of the main results of the empirical exercise. In this part of the work, we report results for firm entry measured using the number of entrants and the number of new firms over registered ones. Results are qualitatively similar for both measures of activity. Table 3 presents the regression results of the pooled Ordinary Least Square (OLS), OLS with fixed effects and Two-Stage Least Squares (2SLS) with fixed effects estimations for the relationship between criminal activities and entrepreneurship. The pooled OLS estimation (Column 1) is identified using cross-province variation, adopting a cross-sectional setting. The estimated coefficient of crime is positive and statistically significant, in line with our expectations (e.g., Rosenthal & Ross, 2010) that criminal activity is concentrated in provinces characterised by high firm entry rates. If we add province-fixed effects to control for idiosyncratic features that characterise Italian provinces, and year dummies to account for unobservable variation common to all provinces (Column 2), the coefficient of the crime variable turns negative, and remains significantly different from zero with an

⁴ The control variables are those presented and described in Section 4: population, unemployment rate, income per capita and the yearly growth in the number of active firms.

elasticity of -0.12. This result is different from what has been found by Rosenthal and Ross (2010) who show a positive coefficient even when time dummies and fixed effects are included in the model. However, since such result was peculiar to specific industries we will discuss it in the following section. Finally, when we employ an instrumental variable approach the estimate is nearly five times larger than for the fixed effects model.⁵ The result is confirmed when we include only the main variable of interest (Column 3), when we add the control (Column 4) and when we exploit two instruments for criminal activities (Column 5). The difference between the OLS FE and the IV strategy suggests that simultaneity, omitted variables and measurement error may be causing downward-biased estimation of the parameter β in the previous specifications. We can see that an increase in criminal activity reduces firm entry. The first-stage F-statistics reported in the lower part of Table 3 are higher than the conventional critical values, which supports the strength and validity of the instrument.⁶

More specifically, the estimation shows that a 1% increase in the crime rate decreases firm entry rates by 0.59% (or 0.54% when using multiple instruments). This implies that reducing crime has a sizeable effect on entrepreneurial activities. For instance, moving from the province at the 75th percentile of the distribution of total crime rates in 2015, to a province at the 25th percentile, increases the firm entry rate by 5.4%.

These estimates are confirmed if we employ the number of new firms over registered businesses (measured in the previous year) as an alternative measure of firm entry (see, e.g., Audretsch & Fritsch, 1994). Table 4 presents the estimations of the model using this alternative measure as the dependent variable. We observe that the negative effect of criminal activity on firm entry is confirmed and, also, that the coefficients of the crime variable experiences a reduction of 0.18 with respect to the previous estimation in Table 3 Column 4. That is, a 1% reduction in crime leads to an increase in firm entry of 0.41% (or 0.35% when we use multiple instruments).

4.2 Crime and firm entry across industries

In the present section we explore the relationship between crime and firm entry by distinguishing between wholesale and retail industries. In so doing we further control for unobserved factors correlated with crime and compare our results with the related literature. Following Rosenthal and Ross (2010) the theoretical reason why we expect a heterogeneous effect across these industries is that retailers are more sensitive to criminal activities due to the fear of crime since they rely more on pedestrians for their economic activities than wholesalers.

⁵ In Column 3 we test whether the inclusion of control variables affect the estimation of the crime coefficient. We can observe that excluding the controls the coefficient of crime is positive and statistically significant.

⁶ In the reduced form, we observed a positive and statistically significant coefficient of the effective abortion rate variable, suggesting that, if the assumption of exclusion of this variable is valid, the combination with a negative first-stage coefficient would result in a negative instrumental variable estimate.

It is important to stress that a direct comparison between our findings and the results obtained by Rosenthal and Ross (2010) is not possible due to a several reasons. First, whereas Rosenthal and Ross (2010) carry out their empirical exercise on five US cities, we focus on the whole Italian territory and exploit variation within provinces. Second, as mentioned above, we explore the decision to start a new business, while Rosenthal and Ross (2010) focus on the sorting of economic activities.

Table 5 reports the results of our model estimations using the number of new firms and the share of firms over registered ones as dependent variables. We observe that criminal activities are negatively associated to firm entry in retail and wholesale industries.⁷ An important distinction is that whereas the effect of crime is negative and significant on firm entry for both retailers and wholesalers, the impact is substantially high for the former. This finding is in line the expectations that retailers are more sensitive to criminal activities due to the relevance of consumers walking in the nearby areas. Wholesale distributors are negatively impacted by crime as well but to a less extent. Moreover, for wholesalers the effect is not significant when we consider the number of firms over registered ones as dependent variables.

4.3. Threats to identification

The aim of this section is to support the validity of our empirical exercise by addressing some threats to identification, focusing on the effective abortion rate. The exclusion restriction requires that the effective abortion rate affects firm entry through its impact on criminal activities. However, a relationship of this instrument with the determinants of the dependent variable would cast doubts on the exogeneity of the former.

First, we explore whether the abortion rate is correlated with the economic performance of Italian provinces. It is important to stress that we project the abortion rate over time exploiting the arrest statistics for each cohort. Although it is mechanically impossible that this variable is directly correlated with the economic performance of thirty years later, there may be a relationship with past structural regional characteristics that also affect firm entry in the subsequent years.⁸

In order to deal with this contingency, we estimate the correlation between the number of voluntary pregnancy interruption and provincial economic performance over the years.

⁷ We also estimate the empirical model focusing on firm entry in restaurants. In line with the previous results, we obtain a negative and significant relationship between crime and firm entry. However, it is impossible for us to discern between different types of restaurants (e.g., high- and low-end restaurants) as has been done in Rosenthal and Ross (2010) who find that an increase in crimes during dinner hours is correlated with a lower share of high-end restaurants.

⁸ It must be noted that the inclusion of province fixed effects enables us to account for the heterogeneity that is province-specific and does not vary over time, such as morphological features, habits, cultural differences, etc.

However, data availability limits this exercise since no economic variables are available at province level over such a wide time window. To overcome this problem, we focus on regions as units of analysis that enable to obtain data on unemployment and employment rates. Although regions are bigger territorial units than provinces, we expect that the heterogeneity within regions is not large enough to confound our results. Data on employment and unemployment rates are particularly interesting for our purposes because they capture a more aggregated indicator that is weighted by population. Indeed, pregnancy interruption strictly depends on the individual and her wealth which may be confounded at an aggregate level. However, the employment and unemployment dynamics give us a picture that is related to the whole population of the region. The rationale is that in a region with high unemployment rate it is more likely to select unemployed people, a feature that would not be possible to capture using income data – since the distribution of income is skewed towards few, richer people.

In Table 6 we report the estimation results of a fixed effect model at the regional level that include, alternatively, the employment and unemployment rate as independent variables. We can observe that apart from the correlation between the employment and the abortion rate, all the other correlations are not significant suggesting that the relationship between economic performance and abortion reduces the relevance of this potential threat.

Second, in the previous sections we stress that legalised abortion allows women to postpone childbearing if socio-economic conditions are suboptimal, thereby, increasing the number of wanted children who are likely to grow up in a better environment (selection effect). As shown previously, this effect is negatively correlated to crime since abortion disproportionately affects those at higher risk of engaging in criminal activity after reaching the criminal age. However, in case abortion rates affect firm entry, this may call the exogeneity of the instrument into question. To support our choice of instrument, we highlight that Italy is characterised by a low level of social mobility. The socio-economic status has a strong intergenerational correlation: (i) almost 66% of children whose parents are less educated attain low education levels; (ii) almost 40% of children with parents employed in manual occupations will work in manual jobs; (iii) almost 31% of children born to low-income families will remain in the same income group as adults (OECD, 2018). These data highlight a generational persistency in socio-economic status. Given the fact that abortion disproportionately affects disadvantaged socio-economic groups, their low degree of social mobility reinforces the assumption that the abortion rate is not correlated directly to entrepreneurship. The literature suggests that, on average, self-employed individuals compared to paid employees, are better educated (Rees & Shah, 1986) and that, compared to other individuals, they display greater responsibility and put a higher value on individual effort (Beugelsdijk & Noorderhaven, 2005). Also, if we distinguish between opportunity and necessity entrepreneurship, the probability of becoming an entrepreneur is associated positively to embeddedness in a social network of entrepreneurs and to the assessment of the skills

required to successfully found a firm (Ardagna & Lusardi, 2008). These points reinforce the theoretical assumptions on the validity of the instrument.

However, in order to provide further support to the exclusion restriction hypothesis we test the robustness of our analysis empirically by focusing on the cohorts of individuals likely to be involved in crime, but rarely to be involved in entrepreneurial activity. This includes cohorts who would have achieved the age of 18 had abortion not been legalised. If we look at the profiles of Italian entrepreneurs, we observe that only 5% of new entrepreneurs are aged under 24 years (ISTAT, 2016). Given the absence of data for each specific age-cohort, we can reasonably assume that this percentage will decrease even more as we move to the 15 year-old cohort (the minimum age for entry into the labour market). The 18-24 year old cohort is responsible, also, for some 20% of crimes (ISTAT, 2020). Table 7 Panel A presents the results for the cohort that would have reached 18 years during the period 2007-2016 had abortion not been legalised. Table 7 Panel B reports the estimations of the model using entry of limited companies as the dependent variable to further check whether abortion is affecting new firm entry: founders of incorporated businesses proved to be more educated and more skilful compared to founders of unincorporated businesses (Levine & Rubinstein, 2017). The results confirm the findings from the main analysis that crime negatively affects the creation of new businesses.⁹

Finally, we can observe from Figure 4 that abortion is particularly low in the islands. This may suggest that a systematic structural feature characterises these regions. As a further robustness check we carry out the main analysis excluding Sardinia and Sicily. Table 8 shows the results of this analysis proving that the main relationship between criminal activities and entrepreneurship is negative and significant.

4.4. Testing for the regional dimension

In addition, we test the robustness of the empirical strategy by estimating the model described in Section 4 and exploiting the regional dimension instead of the province-level. The Italian health system is decentralised and is administered at the regional level; Table 9 measures the effective abortion rate in the region of the focal province. This alternative instrument accounts for the possibility that patients move between hospitals and clinics located in the same region.¹⁰ The estimates suggest that a 1% increase in the rates of total crime reduces firm entry by 0.71% using number of new firms as the dependent variable and by 0.58% using the number of new firms over registered businesses as the dependent variable. These elasticities are slightly lower when we consider the model with two instrumental variables, that is, -0.68% and -0.55%

⁹ This result is confirmed when we employ abortion rate for each cohort from 15 years to 24 years. Results are available upon request.

¹⁰ In 2017, 87% of abortions were performed in the patient's home province and 92% were performed in the patient's home region, suggesting that intra-province movements (within the same region) are rare (Italian Ministry of Health, 2017).

respectively. Again, the empirical analysis emphasises the negative effect of crime on firm entry suggesting that criminal activities bring additional costs which the potential entrepreneur seems to take into account.

Finally, we run the analysis aggregating our dataset at the regional level. In this robustness test we check whether the geographical dimension affects our results. It is important to stress that the units of analysis in this exercise are lower than before. Table 10 shows the results of the regional analysis. Once again the negative relationship between crime and entrepreneurship is confirmed.

5. Conclusions

Over recent decades, several efforts have been made to investigate the economic consequences of criminal activity. Crime may entail the transfer of goods and money from one individual to another (Tullock, 1967), but it carries welfare costs in terms of the resources devoted to beating crime, the intangible costs associated to victimisation (e.g., pain, suffering) and the indirect effects on the economy. Among the negative indirect impacts of crime is the level of entrepreneurial activity. We shed some light on this, employing an instrumental variable approach to estimate the effect of crime on firm entry rates in Italian provinces. Our main finding suggests that crime victimisation reduces entry rates and, therefore, represents an additional cost for the entrepreneur. Thus, crime not only affects the sorting of economic activities within cities, as emphasised in the extant literature (Rosenthal and Ross, 2010; Sloan et al., 2016; Weterings, 2014), it also, and perhaps more importantly, affects the level of entrepreneurial activity. Our results are robust to different empirical settings that we test in order to check whether threat to identification represent an issue. We demonstrated that similar results in both size and sign of the coefficient of interest are obtained using multiple instrumental variables, different proxies for firm entry (i.e., the number of new firms and the number of entry weighted by the number of registered firms), alternative measures of abortion rate and entrepreneurial activities, and excluding provinces with systematic low values of abortion rate.

In addition, we further extend our analysis by investigating the effect of crime on firm entry in specific sectors for which criminal activities should exert heterogeneous results. We observed that crimes negatively affect both retail and wholesale industries. Nevertheless, the magnitude for the former is higher than for wholesalers due to their reliance on consumers walking in the street – for which crimes have a direct negative effect. Our findings further extend the related literature by showing that overall crime represents a cost for the society by reducing the incentives for would-be entrepreneurs to start new businesses. In addition, it emphasises that dealing with the endogeneity that affects the relationship between crimes and firm entry enables to obtain clear-cut evidence of the negative impact of criminal activities. From a policy perspective, crime reduction can be expected to produce an increased rate of new firm formation, which, in turn, can enhance economic growth.

This work suggests opportunities for further research. A comparative quantification of the effect of crime on overall entry rates versus its effect on the sorting of new firm formation, would enhance our understanding of the role of the different ways that crime affects entrepreneurial activities. This could add to knowledge about how policies to reduce crime might affect important determinants of economic growth such as entrepreneurship. Moreover, the present paper employs an instrumental variable approach to identify the effect of crime on firm entry. However, it is fundamental to further explore this relationship by adopting different methodologies (e.g., difference-in-different models, regression discontinuity design, etc.) that would increase our understanding on the costs of crime.

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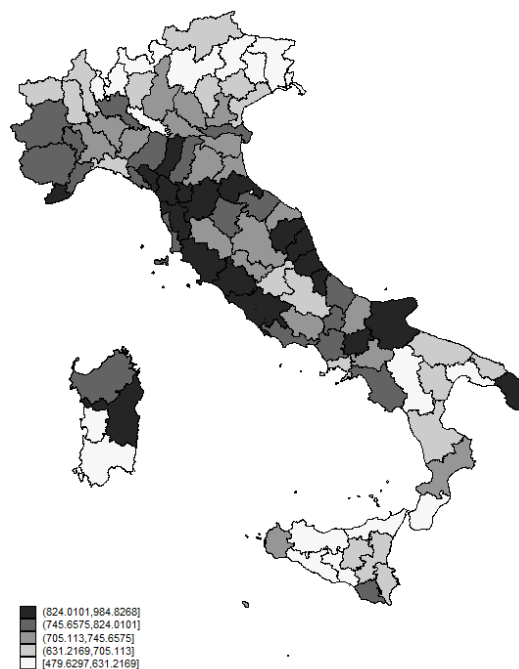
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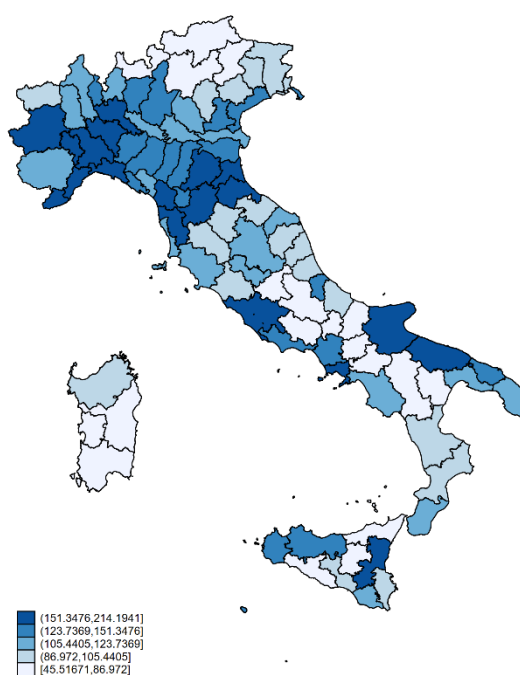
Figures and Tables

Figure 1. Firm entry rates (average 2007-2016)



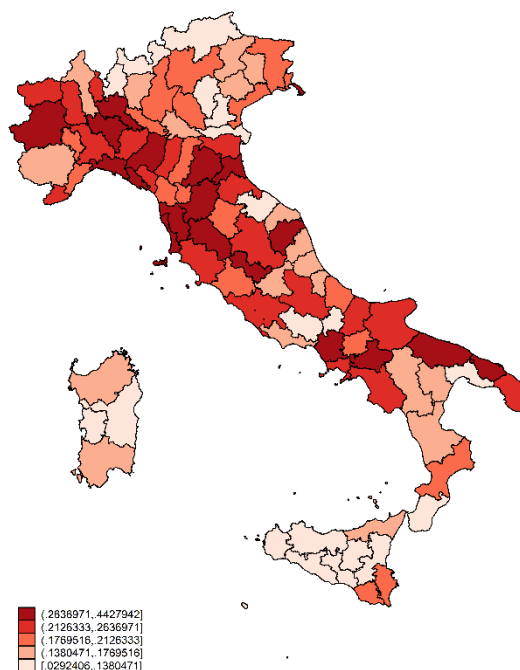
Notes: Darker colours correspond to top quintiles. The statistic concerns limited companies and self-employment per hundred thousands 15-74 year-old inhabitants. Italian province borders are those present in 1980. Source: Own elaboration using data from Movimprese

Figure 2. Geographical distribution of crimes (average 2007-2016)



Notes: Darker colours correspond to top quintiles. The statistics in the figure concern crimes per ten thousands 15-74 year-old inhabitants. Italian province borders are those present in 1980. Source: Own elaboration using data from the Italian Ministry of the Interior

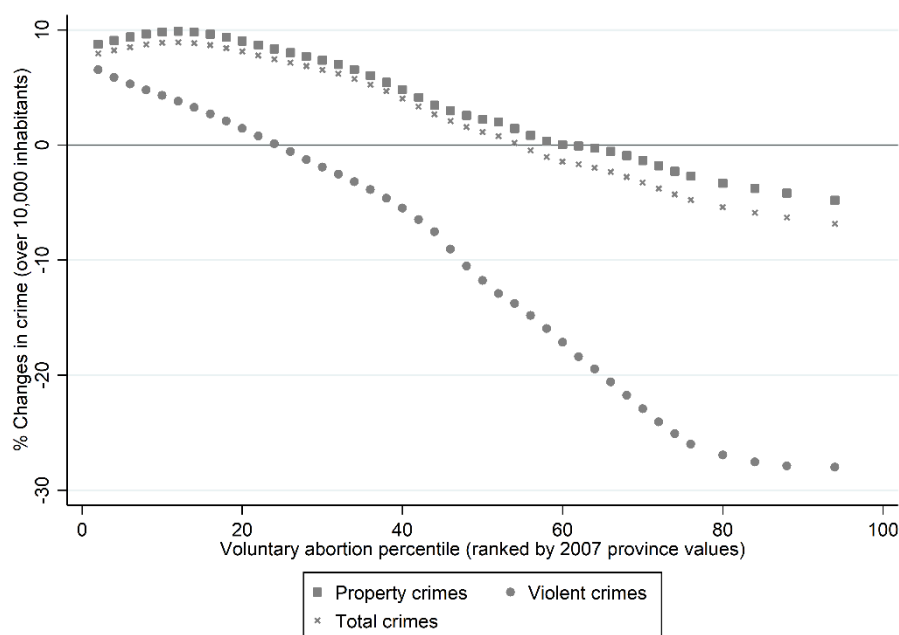
Figure 3. Voluntary abortion intensity (average 2007-2016)



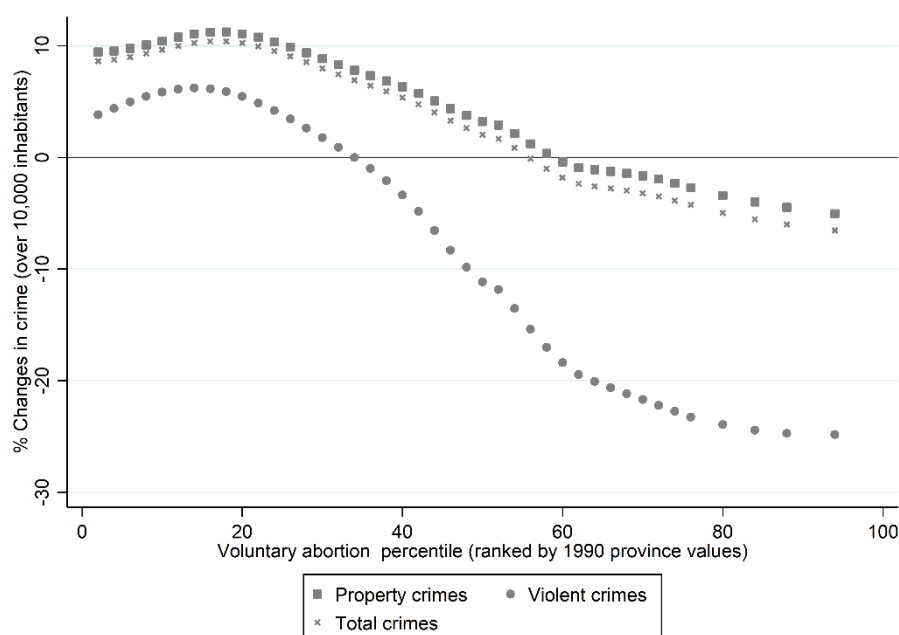
Notes: Darker colours correspond to top quintiles. The statistic in the figure concerns the number of voluntary abortions per live birth. Italian province borders are those present in 1980. Source: Own elaboration using data from the Italian Ministry of

Figure 4. Smoothed changes in criminal activities by voluntary abortion percentile, 2007-2016

Panel A. Smoothed changes in crime by voluntary abortion distribution in 2007



Panel B. Smoothed changes in crime by voluntary abortion distribution in 1990



Notes: The statistics in the figure correspond to property and violent crimes per ten thousands 15-74 year-old inhabitants. Voluntary abortion percentiles

are weighted by population. Italian province borders are those present in 1980. Source: Own elaboration using data from the Italian Ministry of the Health divulged by the Italian National Statistics Institute (ISTAT) in the Health for All database (<https://www.istat.it/it/archivio/14562>, last accessed in January 2020). Data on criminal activities are gathered from the Italian Ministry of the Interior.

Table 1. Socio-economic and demographic characteristics of women who voluntarily interrupt pregnancy

	2005	2016	Difference 2005-2016 (%)
<i>Births</i>	549,088	465,591	-15.2
<i>Voluntary abortions</i>	129,272	84,874	-34.3
<i>Age group</i>			
15-19	7.1	4.4	-38
20-24	14.4	9.5	-34
25-29	14.3	10.3	-28
30-34	12.4	10.1	-18.5
35-39	10.2	8.6	-15.7
40-44	4.6	4	-13
45-49	0.4	0.4	0
<i>Marital status</i>			
Unmarried	9.5	6.6	-30.5
Married	7.7	5.2	-32.5
Divorced, separated, widows	23.6	13.3	-43.6
<i>Education</i>			
<=Primary (elementary or none)	14 ^a	19 ^b	35.7
Secondary	13 ^a	15 ^b	15.4
High school or higher	7 ^a	6 ^b	-14.3
<i>Employment</i>			
Employed	7.6 ^a	7.1 ^b	-6.6
Unemployed	12.5 ^a	11 ^b	-12
Housewives	18.5 ^a	12.3 ^b	-33.5
Students	8.1 ^a	6.4 ^b	-21
<i>Nationality</i>			
Italian	7.3	5.7 ^c	-21.9

Migrants from developed countries	11.1	7.6 ^c	-31.5
Migrants from developing countries	34.9	15.7 ^c	-55
<i>Number of children (15-49)</i>			
None	45.3	44.1	-2.6
1	19.9	22.2	11.6
2	25.5	24.5	-3.9
>3	9.3	9.3	0

Notes: Standardised abortion rates by socio-economic status and demographic characteristics are provided for the years 2005 and 2016. ^a2001, ^b2011, ^c2015 data. Source: ISTAT 2017.

Table 2. The relationship between effective abortion rates and crime

	TOTAL CRIME			
	OLS	OLS FE	OLS	OLS FE
ln(EFFECTIVEABORTION)	0.272*** (0.016)	-0.625*** (0.071)	0.255*** (0.015)	-0.634*** (0.074)
Ln(POLICE EXPENDITURE)			0.168*** (0.017)	-0.018*** (0.005)
ln(UNEMPL)	0.046*** (0.017)	0.056*** (0.015)	0.036** (0.016)	0.058*** (0.016)
ln(INCOME PC)	-0.413*** (0.028)	0.070 (0.373)	-0.117*** (0.036)	0.042 (0.370)
ACTIVEFIRMS	1.237** (0.621)	0.046 (0.267)	-0.427 (0.649)	0.029 (0.267)
INFILTRATION	0.048*** (0.018)	-0.022** (0.007)	0.051*** (0.015)	-0.022** (0.007)
Province FE	No	Yes	No	Yes
Time dummies	No	Yes	No	Yes

Obs	950	950	950	950
F	109.2	19046.1	155	259.4

*Notes: PC stands for Per Capita. The dependent variables are criminal rates per ten thousands 15-74 year-old inhabitants (log). Italian province borders are those present in 1980. Source: Own elaboration using data from the Italian Ministry of the Health divulged by the Italian National Statistics Institute (ISTAT) in the Health for All database (<https://www.istat.it/it/archivio/14562>, last accessed in January 2020). Data on criminal activities are gathered from the Italian Ministry of the Interior. In the OLS estimation we report robust standard errors in parentheses. As for the other estimations Driscoll and Kraay's (1998) standard errors, robust to heteroskedasticity and serial and spatial correlation, are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$*

Table 3. The relationship between crime and firm entry (numbers)

	<i>New firms</i>				
	OLS	OLS FE	IV	IV	IV
	(1)	(2)	(3)	(4)	(5)
ln(TOTALCRIME)	0.439*** (0.038)	-0.120*** (0.020)	-0.652*** (0.069)	-0.588*** (0.070)	-0.541*** (0.051)
ln(UNEMPL)	0.021 (0.018)	-0.067*** (0.020)		-0.034* (0.018)	-0.038** (0.017)
ln(INCOME PC)	-1.494*** (0.063)	0.406*** (0.121)		0.569*** (0.147)	0.552*** (0.141)
ACTIVEFIRMS	7.485*** (1.024)	0.363 (0.300)		0.218 (0.173)	0.233 (0.180)
INFILTRATION	0.008 (0.022)	0.000 (0.006)		-0.003 (0.007)	-0.003 (0.006)
Province FE	No	Yes	Yes	Yes	Yes
Time dummies	No	Yes	Yes	Yes	Yes

Obs.	950	950	950	950	950
F	235.4	30.54	7.876	50.95	144.3
Kleibergen-Paap F			43.56	36.28	16.46
Sargan-Hansen J-stat (p-value)					0.105

*Notes: Dependent variable: number of new firms (limited companies and self-employment) (log). PC stands for Per Capita. All independent variables have a 1-year lag. Italian province borders are those present in 1980. In the OLS estimation we report robust standard errors in parentheses. As for the other estimations Driscoll and Kraay's (1998) standard errors, robust to heteroskedasticity and serial and spatial correlation, are reported in parentheses. Source: Own elaboration using data from the Italian Ministry of the Health divulged by the Italian National Statistics Institute (ISTAT) in the Health for All database (<https://www.istat.it/it/archivio/14562>, last accessed in January 2020). Data on criminal activities are gathered from the Italian Ministry of the Interior. Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$*

Table 4. The relationship between crime and firm entry (over registered firms)

	Entrants over registered firms				
	OLS	OLS FE	IV	IV	IV
	(1)	(2)	(3)	(4)	(5)
ln(TOTALCRIME)	0.142*** (0.012)	-0.074** (0.023)	-0.493*** (0.067)	-0.409*** (0.070)	-0.355*** (0.053)
ln(UNEMPL)	-0.048*** (0.008)	-0.068*** (0.020)		-0.045** (0.018)	-0.049*** (0.019)
ln(INCOME PC)	0.007 (0.011)	0.744*** (0.172)		0.861*** (0.175)	0.842*** (0.175)
ACTIVEFIRMS	2.113*** (0.660)	0.279 (0.289)		0.176 (0.200)	0.192 (0.206)
INFILTRATION	0.009 (0.009)	-0.001 (0.006)		-0.004 (0.006)	-0.003 (0.006)
Province FE	No	Yes	Yes	Yes	Yes
Time dummies	No	Yes	Yes	Yes	Yes

Obs.	950	950	950	950	950
F	44.50	30.57	4.856	45.96	133.7
Kleibergen-Paap F			43.56	36.28	16.46
Sargan-Hansen J-stat (p-value)					0.10

*Notes: Dependent variable: number of new firms (limited companies and self-employment) over registered firms in the previous year (log). PC stands for Per Capita. All independent variables have a 1-year lag. Italian province borders are those present in 1980. In the OLS estimation we report robust standard errors in parentheses. As for the other estimations Driscoll and Kraay's (1998) standard errors, robust to heteroskedasticity and serial and spatial correlation, are reported in parentheses. Source: Own elaboration using data from the Italian Ministry of the Health divulged by the Italian National Statistics Institute (ISTAT) in the Health for All database (<https://www.istat.it/it/archivio/14562>, last accessed in January 2020). Data on criminal activities are gathered from the Italian Ministry of the Interior. Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$*

Table 5. The relationship between crime and firm entry by industries

	New firms		Over registered firms	
	(1)	(2)	(3)	(4)
	Single instr.	Multiple instr.	Single instr.	Multiple instr.
<i>A. Retail industries</i>				
ln(TOTALCRIME)	-0.806*** (0.176)	-0.815*** (0.182)	-0.670*** (0.174)	-0.675*** (0.179)
Kleibergen-Paap F	36.28	18.87	36.28	18.87
Sargan-Hansen J-stat (p-value)		0.409		0.585
<i>B. Wholesale industries</i>				
ln(TOTALCRIME)	-0.420*** (0.066)	-0.406*** (0.073)	-0.014 (0.124)	0.001 (0.130)

Kleibergen-Paap F	36.28	18.87	36.28	18.87
Sargan-Hansen J-stat (p-value)		0.188		0.149

Province FE	No	Yes	Yes	Yes
Time dummies	No	Yes	Yes	Yes

*Notes: Dependent variable: number of new firms (limited companies and self-employment) (log) and number of new firms (limited companies and self-employment) over registered firms in the previous year (log). PC stands for Per Capita. All independent variables have a 1-year lag. Italian province borders are those present in 1980. In the OLS estimation we report robust standard errors in parentheses. As for the other estimations Driscoll and Kraay's (1998) standard errors, robust to heteroskedasticity and serial and spatial correlation, are reported in parentheses. Source: Own elaboration using data from the Italian Ministry of the Health divulged by the Italian National Statistics Institute (ISTAT) in the Health for All database (<https://www.istat.it/it/archivio/14562>, last accessed in January 2020). Data on criminal activities are gathered from the Italian Ministry of the Interior. Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$*

Table 6. The correlation between economic performance and abortion rates over time

	Abortion rate	Number of abortions	Abortion rate	Number of abortions
Employment rate	-.0046 (.0064)	14.46 (75.73)	-.011** (.004)	154.30 (186.4)
Unemployment rate	.0042 (.0025)	286.91 (199.4)	.0035 (.0031)	2.181 (140.09)
Region fixed effects	Y	Y	Y	Y
Time dummies	N	N	Y	Y
Obs	720	720	720	720

*Source: Own elaboration using data from the Health for All database (<https://www.istat.it/it/archivio/14562>, last accessed in January 2020). Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$*

Table 7. Alternative instruments

	Firm entry		Firm entry	
	(Numbers)		(over registered businesses)	
	(1)	(2)	(1)	(2)
	Single instr.	Multiple instr.	Single instr.	Multiple instr.
<i>Panel A: Effective abortion rates (18 year old cohort)</i>				
ln(TOTALCRIME)	-0.533*** (0.065)	-0.531*** (0.065)	-0.370*** (0.071)	-0.366*** (0.071)
ln(UNEMPL)	-0.038** (0.018)	-0.038** (0.018)	-0.048** (0.020)	-0.048** (0.020)
ln(INCOME PC)	0.549*** (0.143)	0.549*** (0.143)	0.847*** (0.188)	0.846*** (0.188)
ACTIVEFIRMS	0.235 (0.177)	0.236 (0.178)	0.188 (0.197)	0.189 (0.197)
INFILTRATION	-0.003 (0.006)	-0.003 (0.006)	-0.003 (0.006)	-0.003 (0.006)
Obs.	950	950	950	950
F	44.42	111	67.80	166.5
Kleibergen-Paap F	45.58	21.74	45.58	21.74
Sargan-Hansen J-stat (p-value)		0.104		0.0995

Panel B: Effective abortion rates (18 year old cohort)
using limited companies' entry as dependent variable

ln(TOTALCRIME)	-0.990*** (0.100)	-0.986*** (0.100)	-0.350*** (0.105)	-0.348*** (0.104)
ln(UNEMPL)	-0.033	-0.033	-0.010	-0.010

	(0.034)	(0.034)	(0.022)	(0.022)
ln(INCOME PC)	1.893***	1.892***	0.933***	0.932***
	(0.274)	(0.274)	(0.156)	(0.156)
ACTIVEFIRMS	0.490***	0.491***	0.372***	0.372***
	(0.187)	(0.186)	(0.141)	(0.141)
INFILTRATION	-0.001	-0.001	0.001	0.001
	(0.009)	(0.009)	(0.005)	(0.005)
Obs.	950	950	950	950
F	40.61	103	15.87	39.95
Kleibergen-Paap F	45.58	21.74	45.58	21.74
Sargan-Hansen J-stat (p-value)		0.147		0.267

*Notes: Dependent variable: PC stands for Per Capita. All independent variables have a 1-year lag. Italian province borders are those present in 1980. Source: Own elaboration using data from the Italian Ministry of the Health divulged by the Italian National Statistics Institute (ISTAT) in the Health for All database (<https://www.istat.it/it/archivio/14562>, last accessed in January 2020). Data on criminal activities are gathered from the Italian Ministry of the Interior. Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$*

Table 8. Main model estimation excluding Italian islands

	<i>Firm entry</i>		<i>Firm entry</i>	
	<i>(Numbers)</i>		<i>(over registered businesses)</i>	
	(1)	(2)	(1)	(2)
	Single instr.	Multiple instr.	Single instr.	Multiple instr.
ln(TOTALCRIME)	-0.435***	-0.417***	-0.273***	-0.264***
	(0.096)	(0.086)	(0.076)	(0.069)
ln(UNEMPL)	-0.041*	-0.043*	-0.039	-0.040*
	(0.023)	(0.022)	(0.024)	(0.024)
ln(INCOME PC)	1.141***	1.138***	1.601***	1.599***

	(0.328)	(0.328)	(0.337)	(0.338)
ACTIVEFIRMS	0.424**	0.428**	0.330	0.332
	(0.199)	(0.205)	(0.208)	(0.210)
INFILTRATION	-0.004	-0.004	-0.001	-0.001
	(0.005)	(0.005)	(0.005)	(0.005)
Obs.	861	861	861	861
F	15.34	18.22	37.46	22.46
Kleibergen-Paap F	82.78	39.16	82.78	39.16
Sargan-Hansen J-stat (p-value)		0.292		0.467

Notes: Dependent variable: number of new firms (limited companies and self-employment) (log) and number of new firms (limited companies and self-employment) over registered firms in the previous year (log). PC stands for Per Capita. All independent variables have a 1-year lag. Italian province borders are those present in 1980. Source: Own elaboration using data from the Italian Ministry of the Health divulged by the Italian National Statistics Institute (ISTAT) in the Health for All database (<https://www.istat.it/it/archivio/14562>, last accessed in January 2020). Data on criminal activities are gathered from the Italian Ministry of the Interior. Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 9. Alternative instrument: regional level of abortion

	Firm entry		Firm entry	
	(Numbers)		(over registered businesses)	
	(1)	(2)	(1)	(2)
	Single instr.	Multiple instr.	Single instr.	Multiple instr.
ln(TOTALCRIME)	-0.710***	-0.680***	-0.586***	-0.552***
	(0.087)	(0.082)	(0.098)	(0.090)
ln(UNEMPL)	-0.026**	-0.028**	-0.033***	-0.035***
	(0.013)	(0.013)	(0.012)	(0.012)
ln(INCOME PC)	0.611***	0.600***	0.922***	0.910***
	(0.170)	(0.165)	(0.185)	(0.183)
ACTIVEFIRMS	0.181	0.190	0.121	0.132
	(0.127)	(0.131)	(0.162)	(0.164)

INFILTRATION	-0.004 (0.007)	-0.004 (0.007)	-0.005 (0.007)	-0.005 (0.007)
Obs.	950	950	950	950
F	16.69	13.92	18.47	15.89
Kleibergen-Paap F	129.8	59.53	129.8	59.53
Sargan-Hansen J-stat (p-value)		0.128		0.101

*Notes: Dependent variable: number of new firms (limited companies and self-employment) (log) and number of new firms (limited companies and self-employment) over registered firms in the previous year (log). PC stands for Per Capita. All independent variables have a 1-year lag. Italian province borders are those present in 1980. Source: Own elaboration using data from the Italian Ministry of the Health divulged by the Italian National Statistics Institute (ISTAT) in the Health for All database (<https://www.istat.it/it/archivio/14562>, last accessed in January 2020). Data on criminal activities are gathered from the Italian Ministry of the Interior. Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$*

Table 10. The regional analysis

	Firm entry		Firm entry	
	(Numbers)		(over registered businesses)	
	(1)	(2)	(1)	(2)
	Single instr.	Multiple instr.	Single instr.	Multiple instr.
ln(TOTALCRIME)	-0.657*** (0.084)	-0.604*** (0.090)	-0.486*** (0.075)	-0.426*** (0.075)
ln(UNEMPL)	-0.178*** (0.054)	-0.183*** (0.054)	-0.177*** (0.049)	-0.183*** (0.050)
ln(INCOME PC)	2.294*** (0.716)	2.210*** (0.716)	2.033** (0.839)	1.939** (0.879)
ACTIVEFIRMS	0.579** (0.296)	0.562* (0.306)	0.723** (0.285)	0.704** (0.297)
INFILTRATION	-0.006* (0.004)	-0.006* (0.003)	-0.004 (0.003)	-0.003 (0.003)

Obs.	950	950	950	950
F	36.82	60.33	53.99	103.7
Kleibergen-Paap F	130.5	56.58	130.5	56.58
Sargan-Hansen J-stat (p-value)		0.214		0.203

*Notes: Dependent variable: number of new firms (limited companies and self-employment) (log) and number of new firms (limited companies and self-employment) over registered firms in the previous year (log). PC stands for Per Capita. All independent variables have a 1-year lag. All variables are calculated at the regional level. Source: Own elaboration using data from the Italian Ministry of the Health divulged by the Italian National Statistics Institute (ISTAT) in the Health for All database (<https://www.istat.it/it/archivio/14562>, last accessed in January 2020). Data on criminal activities are gathered from the Italian Ministry of the Interior. Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$*