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**University of Naples Federico II**

**University of Salerno**

**Bocconi University, Milan**

**CSEF - Centre for Studies in Economics and Finance**
**DEPARTMENT OF ECONOMICS AND STATISTICS – UNIVERSITY OF NAPLES FEDERICO II**
**80126 NAPLES - ITALY**
**Tel. and fax +39 081 675372 – e-mail: csef@unina.it**
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# *Public Certification to Fight against Illegality: Evidence on Private Investment*

**Antonio Acconcia[*], Maria Rosaria Alfano[†], Anna Laura Baraldi [‡], and Claudia Cantabene[§]**

**Abstract**
In 2012, the Italian government introduced public certification to signal creditworthy firms not involved in corruption and accounting frauds, and with no connections to mafias. In the case of loan applications, this certification can determine lower credit costs due to the lower firm screening costs incurred by the banks. We provide evidence consistent with its effectiveness in mitigating financial frictions. Our results show that certified firms increase their tangible capital expenditure, and show also that the effect of the certification is stronger in areas where it is more difficult for the banks to assess firms' creditworthiness. This latter finding has implications for local development.

**JEL classification:** G14, G21, H40, H81, R38

**Keywords:** Corruption and Organized Crime, Creditworthiness, Investment, Public Certification.

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[*] Università di Napoli Federico II and CSEF. E-mail: antonio.acconcia@unina.it

[†] Università della Campania L. Vanvitelli. E-mail: mariarosaria.alfano@unicampania.it

[‡] Università della Campania L. Vanvitelli. E-mail: laura.baraldi@unicampania.it

[§] Università della Campania L. Vanvitelli. E-mail: claudia.cantabene@unicampania.it

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# 1 Introduction

Since the 2008-09 global financial crisis, the impact of access to credit on capital formation has been a major worldwide policy issue. Information asymmetry between lenders and borrowers is the main determinant of credit access constraints and has negative impacts on firms' capital formation, employment, and economic efficiency.[1] Banks generally require information on the borrower's creditworthiness and the project's riskiness to allow those projects to be financed to be sorted. The costly screening which this involved plays a significant role in the allocation of credit to firms (Manove et al., 2001; Eslava and Freixas, 2018). Also, since banks too often conduct insufficient screening and rely heavily on collateral (Song and Thakor, 2010), a reduction in screening costs should mitigate financing constraints and facilitate firms' access to credit which ultimately, should result in increased investment. Our study, which exploits a policy introduced by the Italian government with the ultimate purpose of fostering the activity of firms that act in accordance with the law, provides evidence consistent with this prediction.

In 2012, the Italian government introduced Legality Rating (LR) to strength the fight against corruption, organized crime activities, accounting frauds, and environmental crimes. LRs are awarded to firms able to satisfy specific requirements related to enabling assessment of their creditworthiness and compliance with public tendering rules. Since the introduction of LR, any firm can apply to the Italian Antitrust Authority (AGCM) for a LR, to the extent that it has been recorded in the Italian Companies Register by at least two years. Its period of validity is two years and firms can reapply after the validity period. The value of the LR for firms applying for bank loans is clear: it signals good creditworthiness which reduces the credit checks and credit conditions imposed by the banks. According to MEF-MISE Decree No. 57/2014, in view of the LR banks are explicitly encouraged to lower the costs of credit and speed up bank approval times for loan applications. As a result, firms with an LR should benefit from cheaper loan interest rates and speedier loan assignment procedures. Moreover, similar to the case of sharing default information we can expect LRs to improve borrower behavior and ensure repayment of the loan on expiry, in order to get the award back (Padilla and Pagano, 2000; Jappelli and Pagano, 2002). Overall, the LR should boost firm investment.

Based on our entire firm sample, we provide evidence that firms with an LR increased their stock of tangible capital by 0.3-0.6 percentage points of total assets, that is about 3%-5% of the median capital-to-total asset ratio. However, examination by sector reveals that the impact is concentrated mainly among firms producing equipment goods and supplying transportation services while regional evidence suggests a stronger effect in the South where borrowing constraints on firms and households historically are tighter (Guiso et al., 1996; Schiantarelli et al., 2020).

The main objective of the policy is to provide information which the banks can use to distinguish good and bad credit risks. However, the government authority which issues the firm LR ratings also regulates and oversees the banks and the amount of credit issued. This raises a potential concern that the LR policy allocates credit by signaling which firms and industries government favors. This would mean that our main evidence is driven by this distortion rather reduced asymmetry of information between the banks and firms. Institutional information on the LR policy is reassuring and makes it clear that LRs are awarded conditional on fulfillment of objective requirements. The government authority can demand further clarification in the case of incomplete applications but this delays award of the rating. Also and

[1] For instance, Manaresi and Pierri (2017), Aghion et al. (2019), and Besley et al. (2020) provide recent evidence of the negative impact of financial constraints on productivity in Italy, France, and UK respectively. Evidence on the effects on employment is reported by Acconcia et al. (2020).

relevant for the interpretation of our main evidence, while the banks are explicitly encouraged by the AGCM to lower the credit costs for certified firms, they are not compelled to do so. Hence, the effect we estimate cannot be related to the bank's behavior in complying with a legal obligation. In fact, the banks provide the Bank of Italy with annual lists of cases where the LR made no difference. For confidentiality reasons we do not have information on which firms did not benefit from lower borrowing cost. Given that, we may interpret our empirical investigation as related to an intention to treat study design.

In order to delve deeper into the LR mechanism, we use data on notices of protest to proxy for the difficulties experienced by the banks in identifying reliable firms. As expected, changes in capital stock are shown to be correlated negatively with the values of this proxy. However, the coefficient of the interaction between this proxy and the rating variable is positive and statistically significant, suggesting that the impact of the LR is stronger in those provinces where the identification of reliable firms is more difficult. This is consistent with the Italian government's introduction of the LR to alleviate asymmetric information in the firm-bank relationships and to stimulate investment. It is also consistent with evidence by Bellucci et al. (2021) that borrower certification is associated with lower cost of debt mainly when the amount of private information of the bank is low.

In addition to the above mentioned literature our study contributes to work on the practice of third-party certification. Carter and Manaster (1990) and Lee and Wahal (2004) highlight the role of high-ranked underwriters and venture capitalists in initial public offerings. Feldman and Kelley (2006) show that receipt of a government R&D subsidy increases the funding obtained from other sources. Martí and Quas (2018) and Meuleman and De Maeseneire (2012) study cases of government certification of small firms in relation to banks in Spain and Belgium respectively. In particular, our findings related to notices of protest are in line with evidence suggesting that the certification effect is stronger for less transparent companies (Bonaccorsi di Patti and Dell'Ariccia, 2004; Gao et al., 2019) with weaker intellectual property rights protection, and evidence in Chavez (2017) on the beneficial role of a credit information sharing system especially for less transparent firms (Li et al., 2019).[2]

The rest of the paper is organized as follows. Section 2 describes the LR and section 3 presents the data and discusses the empirical specification. Section 4 reports the main results and section 5 concludes the paper.

## 2 The Legality Rating

The LR was introduced by Legislative Decree No. 1, 2012, and is regulated by AGCM Resolution No. 24075, November 14, 2012. It sets access requirements, evaluation criteria, and renewal procedures. The LR is available to firms headquartered in Italy recorded in the Italian Companies Register for at least two years, with revenue in the year before the application of at least €2million.[3] By summing up the level of compliance with these high standards of legality, this indicator should reveal the legal way of doing business. The conditions for award of the LR and the implications of this information mean that the LR is similar to third-party certification of a loan applicant's creditworthiness.

To receive one-star LR the firm must ensure that entrepreneurs, managers, and administrative staff

[2]The legality award is in line with the Corporate Social Responsibility principles, by which firms voluntarily decide to adopt initiatives consistent with ethical principles aimed at improving society as a whole (Wartick and Cochran, 1985; Sen and Bhattacharya, 2001). Hence, it has also attracted the attention of scholars interested in its potential to foster ethical culture of organizations and compliance with the law (Caputo and Pizzi, 2019; Ginesti et al., 2018; Formisano et al., 2018).

[3]The last requirement should prevent illegal organizations from obtaining the LR through fictitious companies.

have never been involved in crimes related to tax compliance, workplace safety, embezzlement of public funds, or antitrust regulation. Entrepreneurs and top executives must certify that they have never been prosecuted for any type of criminal activity.

Specifically according to the 2012 Legislative Decree, to receive one-star LR the firm must confirm: a) no conviction or other personal and/or patrimonial precautionary measures against top management (relative to an individual or collective company); c) no court judgment or precautionary measures against the firm for crimes listed in Legislative Decree n. 231 dated June 8, 2001; d) No conviction issued by the AGCM and or the European Commission for serious antitrust violations by the firm; e) no conviction for tax evasion directly or indirectly involving the firm; f) no assessment of failure to comply with protection of health and safety rules in the workplace; g) traceability related to payments and financial transactions in excess of €1,000 (€3,000 since January 2016); h) no record implying that the firm did not repay any debt based on a public loan.[4] The amendments to the 2012 decree also impose the following conditions: i) no conviction for unfair commercial practices and for non-compliance with the provisions of the AGCM; ii) no disciplinary action by the Italian anti-corruption agency ('Autorità Nazionale Anticorruzione'); iii) absence of legal or factual control by foreign companies or entities in the case it is not possible to identify the shareholder or persons that control the company. Finally, firms under compulsory administration or involved in anti-mafia interdiction measures will not be awarded an LR.

Clearly, the conditions for LR are stringent and must be verifiable by the AGCM, and shown to have been met for at least two years before application for a LR. During the two years to which the LR applies the AGCM monitors the firms to assess whether the conditions for the rating still apply; if they are found not to apply the LR can be revoked. After two years, the firm can ask for a renewal of the LR.

The two-star and three-star LRs are awarded to firms that meet some additional (3 or 6) requirements from the following list: 1) compliance with Confindustria legality protocols; 2) traceability of low-value payments below €1,000; 3) compliance with Corporate Social Responsibility principles; 4) implementation of a system of corporate compliance; 5) inclusion in the provincial 'White List' of firms clean of mafia association; 6) adherence to self-regulation ethical codes adopted by trade associations; 7) implementation of practices to prevent the diffusion of corruption. If evidence emerges that these additional conditions are no longer being satisfied, the AGCM will downgrade the firm's LR. Note that while the basic requirements are concrete objective criteria, some of the additional requires are based on soft rules.

The potential economic benefit of an LR for borrowing firms is clear.[5] Since it provides evidence of fulfillment of the requirements which generally are part of the banks' checks when assessing the creditworthiness of a loan applicant, the LR reduces the bank's screening costs. The main implication is that the interest rate on the loan could be reduced accordingly, thus causing a rise in investment. The banks are explicitly encouraged by government to lower the price of the loans to firms with LRs. The banks also are required to provide evidence to the Italian central bank that they have taken due account of the LR. This requirement increases the efficacy of the LR as a mechanism to reduce credit costs.

Aggregate firm data from the Bank of Italy on LR certification suggests that many of firms have

[4] A number of initiatives have been implemented in Italy since 2010 to reduce use of cash. Legislative Decree No. 138/2011 sets the cash threshold at €2,500; the Legislative Decree No. 201/2011 approved during the Monti Government reduced this threshold to €1000, while from 2016 Law no. 208/2015 increased the threshold to €3000. Legislative Decree n. 124/2019 (which will become effective in 2022) fixes the threshold at €1,000.

[5] Benefits apply also to public tenders. MEF Decree No. 57, February 20, 2014, art. 3 establishes that Public Administrations must include at least one of the following reward systems in the call for regional grant or funds: a) preference in ranking; b) additional score; c) reserve share of funds.

benefited from it. Between 2015 and 2019 some 50% of firms have benefited from: (i) reduced approval time (77%); (ii) better economic conditions (71%); and (iii) lower administration fees (34%). Although some firms in receipt of a loan did not report any specific advantages, the low yearly rejection rates for loan applications is remarkable - in the range 2%-5% per year.[6]

# 3 Data and Empirical model

Table 1 presents the number of firms awarded an LR, and the number of applications and renewals. It shows a strong increase over time. In 2013, the AGCM received 142 applications resulting in 90 firms being awarded LR. In 2014, applications were 441 and LR awards had roughly doubled. In 2015, the number of applications was 1,525 (+ 246%) and the number of LR awards was 1,083 (+ 492%). The continuing sharp increases in subsequent years show the trust companies place on this rating. In the case of renewals, some 40% of firms awarded an LR in 2013 obtained a renewal in 2015; the percentage was higher in 2017.

The distribution of LR awarded firms between the North and South of Italy is a good reflection of the distribution of Italy's total firms, suggesting that interest in obtaining the rating is fairly evenly spread across Italy (see Figure 1). As expected, Lombardia (in the North of Italy) has the highest number of LR firms, followed by Emilia Romagna, and in the South of Italy, the highest numbers are in Campania. Figure 2 shows distribution of LR awards by sector: (i) Investment goods, Equipment, and Transportation; (ii) Wholesale, Retail, and Services; (iii) Consumption Goods; (iv) House Building and Construction. Nearly half of total LRs are awarded to equipment and investment goods producers, and suppliers of transportation services, that is firms which tend to operate on bank credit. A third of the LRs awarded go to firms in the retailing and wholesaling sectors and the remainder go to consumer goods, and construction sector firms.

## 3.1 Empirical Model

The effect of interest is investigated mainly through the following baseline empirical specification estimated on a panel of firm-level year data:

$$\Delta K/A_{i,t} = \alpha + \beta Rating_{i,t} + \delta Rating_{i,t-1} + \phi X_{i,t} + \varepsilon_{i,t} \tag{1}$$

where $\Delta K/A_{i,t}$ is our measure of investment by firm $i$, namely the time variation of tangible fixed assets over total assets, $Rating_{i,t}$ is a dummy which scores 1 if firm $i$ received the LR for the first time in year $t$, $X_{i,t}$ is a vector containing control variables (thus $\phi$ is a vector of the coefficients) including change in sales, change in profit rate, change in wage bill, and industry (ATECO-2007 code, 2digit) and year fixed effects.

We acknowledge that inferences in panel estimations can be misleading in the case of spatial correlation within groups of observations. We account for the possibility that the decisions of firms in the same municipality will be correlated as a result of an unobserved cluster effect due to common administrative rules and policies. Therefore, our inference will be based on standard errors robust to contemporaneous spatial correlation and heteroskedasticity. Systematic firm-level heterogeneity is absorbed by taking the first difference of the capital-asset ratio; however, we obtained similar results using the capital-asset ratio

[6] Lack of complete documentation among new customers is the main reason why LRs are not considered by the bank to assess their credit rating.

and firm-level fixed effects. In this case, inference is based on standard errors robust to correlation at firm level to capture any serial correlation of the outcome variable. However, the main result holds also with non-clustered standard errors and, most crucially, when we control for anticipation effects and firm heterogeneity using the lagged value of investment. The rating dummy is also introduced lagged to capture any delayed effect.

The time span analyzed is 2013-2019 and applies to around 10,000 firms, that is virtually all treated, rated firms. Note especially that since we rely on panel data for these firms, we do not need a comparison group of untreated firms in order to investigate the effects of the policy. This avoids any concern over comparison consistency. Our results are driven mainly by the differential timing of the treatment and within-firm variability in the outcome variable.

# 4 Results

Table 2 presents our baseline results. Column 1 reports the estimated key coefficients in the empirical specification which includes fixed effects for year, firm legal status, and region where the firm is headquartered. The impact effect is estimated to be positive and significantly different from zero at the conventional 5% level. We found no delayed effect due to award of the LR. Point estimates of the two coefficients of interest do not change if we include the full set of controls (see column 2). The t-statistic of the impact effect increases signaling that our controls are uncorrelated with the dummy rating but correlated with the outcome variable. This means that the impact effect is more precisely estimated.

Column 3 includes a dummy to control for the behavior of firms included in the so-called White List. According to the Law 190/2012, the White List consists of firms that meet the anti-mafia requirements—Art. 67 and Art. 84, paragraph 3, of Legislative Decree 159/2011 (Anti-mafia Code).[7] Again, our main evidence does not change.

The results in column 4 are more relevant: to control for an inertia effect and intertemporal substitution of fixed capital expenditure, we add to the baseline specification the lagged value of our investment measure. It could be argued that the rational entrepreneur will anticipate that the AGCM will awarded the LR in the next future, and thus may decide to reduce their expenditure to wait for better days. However, the estimates controlling for lagged investment are qualitatively and quantitatively very similar to those in column 2. The invariance of the results with respect to the baseline model suggests that anticipation is not affecting our estimates. It is interesting that the coefficient of the autoregressive term is relevant to predict the variability of current investment—the t-statistic is greater than 5 in absolute value. Therefore, the irrelevance of lagged investment for estimating the effect of the LR is due mainly to the absence of correlation between these two variables. This provides further support for the exogeneity of our main regressor.

Column 5 reports the estimates pursuing a different strategy to control for systematic differences among firms. We estimated the model in the level of K/A adding a firm-specific fixed effect and two lags of $K/A$ on the right-hand side. Again, the results are similar to those obtained with the baseline specification. Overall, we can conclude that the impact effect is always statistically significant and different from zero, and that the coefficient of the lagged rating dummy is never statistically different

[7]The White List is an experimental tool designed to combat the phenomenon of mafia inflation in public institutions. Recorded firms must confirm that they apply rigorous checks on organizational and functional transparency, respect tax obligations, and apply traceability to financial flows.

from zero. Estimates of the impact effect are stable across alternative specifications.

Table 3 shows that as expected, the findings change if we replace the *Rating* dummy with the *Placebo* dummy which takes the value 1 in the year that the firm receives renewal of the LR award, at the expiration of its validity. Since confirmation of the award does not change the status on the firm it follows that we find no effect of the *Placebo* dummy. This is consistent with LR reducing the bank's screening efforts linked to application for a loan.

Table 4 presents the results by sector. The estimated impact effect is positive and very similar for firms supplying equipment and transportation services and firms operating in the distribution sector. It is insignificantly different from zero for the other firms in the sample. In the case of equipment and transportation sector firms we found a statistically significant delayed effect for LR award, with a size similar to the impact effect. This suggests a cumulative effect over the two years of about 0.67 percentage points, roughly 4% of the sample median capital to total asset ratio. The distribution estimate implies an effect of roughly 3%.

## 4.1 Why does the Legality Rating Matter?

The information value of the LR will be greater in areas where bank screening costs are higher, with implies higher interest rates for borrowing firms. Therefore, ceteris paribus firm investment should be fostered by the LR rating award in sectors where insolvency problems are more serious. To proxy for differences in these costs across provinces, we rely on total number of protests relative to notes, promissory notes, and sight drafts. We expect that the higher their number the more difficult it will be for the banks to ascertain the true credit worthiness of the potential borrower, and thus the greater the information value of the LR.

Table 5 presents the results for the empirical specification which includes the variable *Protest*—the number of province level protests divided by the total number of firms operating in the province—and its interaction with the dummy *Rating*. The coefficient of the interaction term is estimated to be positive and statistically significant if the two main sectors are pooled or if they are considered separately. In either case its size indicates an economically relevant effect. In particular, when evaluated at the median value of *Protest* the effect of being awarded the LR implies an increment in capital of 0.57. This increases to around 1 in provinces where the number of protests is around the $75th$ percentile of the distribution, and reduces to 0.3 if protests are around the $25th$ percentile. Therefore, the effect of the LR in provinces characterized by relatively high unconditional probability of insolvency—and thus high screening costs for the banks—is three times higher than the effect if this risk is relatively low. These effects are similar across the two industry aggregates.

Historically, the South of Italy is characterized by stronger borrowing constraints on firms and households (Guiso et al., 1996; Schiantarelli et al., 2020). This is often ascribed to the alleged larger sized illegal economy with respect to the rest of the country. When illegality becomes widespread, it exacerbates firms' financing constraints and dampens investment and growth. Banks are less willing to lend because of the greater difficulty to assess the quality of the borrowers using standard procedures (Bonaccorsi di Patti, 2009). Also, credit supply constraints increase if illegal behaviors occur in contexts characterized also by an inefficient judiciary system which is the case in Southern Italy (Jappelli et al., 2005).[8] We thus expect

[8]Countries with better enforcement of contracts are characterized by lower costs of bank credit and a lower probability of being credit constrained (Laeven and Majnoni, 2003; Moro et al., 2018). In these countries, banks tend to offer longer maturity loans and charge lower interest rates (Bae and Goyal, 2009).

a stronger impact of the LR in the South.

Results reported in Table 6, based on separate empirical models estimated for Southern and Northern Italy, accord with such prediction. The LR affects firms in both areas of the country and has higher quantitative relevance in the South. Evidence that it matters in Northern Italy also makes clear that our results are indeed capturing the impact of the LR and not a kind of South effect.

# 5 Conclusions

In 2012, the Italian government implemented public certification—the LR—to reduce information asymmetry between banks and firms and signal the legality of awarded firms. The LR was designed to foster the supply of bank credit by reducing bank screening costs in relation to loan requests.

We investigated the expected effect of the LR by looking at variability in tangible fixed assets during 2009-19, for the population of certified firms in Italy. Our estimates show a relevant impact of public certification mainly for firms producing equipment goods and supplying transportation services, that is firms where physical capital is a relevant production input. We found also that the size of the effect is greater in those provinces with higher bank screening cost.

Our study has implications for local development. In areas with high levels of illegal behaviors and inefficient judiciary systems—issues that tend to be closely related - *good* firms, ceteris paribus, usually find it more difficult to obtain a loan. In these cases, the LR is a useful instrument for these firms. Also, in countries characterized by spatial concentration of financial services which tend to be located in rich areas, the LR may alleviate spatial difference in the cost of bank credit.

# A Data Description

The AGCM provides information on firms awarded with the Legality Rating. Balance sheet data are from Bureau van Dijk. Data on notices of protest are from ISTAT. Definitions of main variables employed in the empirical analysis are reported in the following.

- Tangible Fixed Assets over Total Assets, $K/A_{i,t}$
- Dummy equal to 1 if firm $i$ received the legality award for the first time in year $t$, $Rating_{i,t}$
- Number of Notices of Protest (province level) divided by the total number of firms operating in the province, $Protest$
- Earnings before interests, taxes, depreciation and amortization (Ebitda) divided by total revenues
- Total Revenues
- Total Wage Bill
- Legal Status of the Firm
- Business Sector according to the ATECO-2007 (two-digit level) Classification

Tangible Fixed Assets over Total Assets, Total Wage Bill, Total Revenues, and Ebitda enter the empirical specification as yearly variations.

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Table 1: Firms awarded with the Legality Rating

| Year | Requests | Assignments | Renewals |
|---|---|---|---|
| 2013 | 142 | 90 | |
| 2014 | 441 | 183 | |
| 2015 | 1525 | 1083 | 36 |
| 2016 | 2501 | 1635 | 71 |
| 2017 | 3169 | 2472 | 438 |
| 2018 | 3887 | 2846 | 691 |
| 2019 | 4108 | 2827 | 973 |

Notes: The table reports the number of firms awarded with the legality rating (together with number of applications and renewals) by year of assignment. The source of the data is AGCM, *Relazione annuale sull'attività svolta* (various issues).

Table 2: Investment and Rating

| | (1) FD | (2) FD | (3) FD | (4) FD | (5) FE |
|---|---|---|---|---|---|
| Rating | 0.255** | 0.258*** | 0.258*** | 0.260*** | 0.230*** |
| | (3.05) | (3.55) | (3.54) | (3.56) | (3.68) |
| *Lag* Rating | 0.158 | 0.113 | 0.113 | 0.118 | 0.145* |
| | (1.81) | (1.46) | (1.46) | (1.51) | (2.13) |
| *Lag* $\Delta K/A$ | | | | -0.038*** | |
| | | | | (-5.94) | |
| *Lag* $K/A$ | | | | | 0.651*** |
| | | | | | (78.70) |
| $Lag^2$ $K/A$ | | | | | -0.053*** |
| | | | | | (-8.65) |
| N | 78,080 | 76,912 | 76,912 | 68,572 | 68,572 |

Notes: Data are firm level and annual from 2009 to 2019. For the empirical specifications reported in columns 1-4 the dependent variable is the year-on-year change in tangible fixed assets, scaled by total assets. For the empirical specification reported in the column 5 the dependent variable is the level of $K/A$. The dummy variable *Rating* equals 1 if firm $i$ received the LR for the first time in year $t$ and 0 otherwise. The estimated equation reported in the column 1 includes year, firm legal status and region of the firm's headquarter fixed effects. All other estimated equations include yearly changes in sales, profit rates, wage bills, and sector (2-digit level) dummies. The estimate in column 3 includes the White List dummy. The t-statistics relative to clustered standard errors at the municipality×year level and robust to heteroskedasticity are in parentheses. Statistical significance is denoted: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 3: Investment and Rating, Placebo

| | (1) | (2) | (3) |
|---|---|---|---|
| Placebo | 0.099 | -0.023 | -0.015 |
| | (0.84) | (-0.24) | (-0.17) |
| *Lag* $\Delta K/A$ | | | -0.038*** |
| | | | (-5.93) |
| N | 78,080 | 76,912 | 68,572 |

Notes: Data are firm level and annual from 2009 to 2019. The dependent variable is the year-on-year change in tangible fixed assets, scaled by total assets. The dummy variable Placebo equals 1 if in year $t$ firm $i$ received the Legality Rating for the second or third time, and 0 otherwise. The estimated equation reported in column 1 includes fixed effects for year, firm legal status, and region of the firm's headquarter. All the other estimated equations include yearly changes in sales, profit rates, wage bills, and sector (2-digit level) dummies. The t-statistics relative to clustered standard errors at the municipality×year level and robust to heteroskedasticity are reported in parentheses. Statistical significance is denoted: * $p < 0.05$, **$p < 0.01$, *** $p < 0.001$.

Table 4: Investment and Rating by Sector

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Rating | 0.369*** | 0.276* | 0.188 | -0.049 |
| | (3.45) | (2.08) | (0.96) | (-0.20) |
| *Lag* Rating | 0.300* | -0.102 | 0.095 | -0.234 |
| | (2.48) | (-0.72) | (0.47) | (-0.81) |
| N | 33,569 | 22,431 | 10,178 | 5,756 |

Notes: Data are firm level and annual from 2009 to 2019. The dependent variable is the year-on-year change in tangible fixed assets, scaled by total assets. The dummy variable *Rating* equals 1 if in year $t$ firm $i$ received the Legality Rating for the first time, and 0 otherwise. All estimated equations include fixed effects relative to year, firm legal status, and region of the firm's headquarter, and yearly change in sales, profit rate, and wage bill, and sector (2-digit level) dummies. The t-statistics relative to clustered standard errors at the municipality×year level and robust to heteroskedasticity are reported in parentheses. Statistical significance is denoted: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 5: Rating and Notices of Protest

| | (1) Sec1+Sec2 | (2) Sec1 | (3) Sec2 |
|---|---|---|---|
| Rating | 0.501*** | 0.486*** | 0.501** |
| | (4.97) | (3.88) | (2.91) |
| Protest × Rating | 5.835** | 4.162 | 9.029* |
| | (3.23) | (1.94) | (2.58) |
| Protest | -0.646 | -0.271 | -1.296 |
| | (-1.13) | (-0.36) | (-1.51) |
| *Lag* Rating | 0.132 | 0.287* | -0.134 |
| | (1.44) | (2.36) | (-0.95) |
| N | 55,486 | 33,254 | 22,232 |

Notes: Data are firm level and annual from 2009 to 2019. The dependent variable is the year-on-year change in tangible fixed assets, scaled by total assets. The dummy variable *Rating* equals 1 if in year $t$ firm $i$ received the Legality Rating for the first time, and 0 otherwise. The variable *Protest* is the number of province-level protests divided by the corresponding total number of firms operating in the province. All estimated equations include fixed effects relative to year, firm legal status, and region of the firm's headquarter, and yearly change in sales, profit rate, and wage bill, and sector (2-digit level) dummies. The t-statistics relative to clustered standard errors at the municipality×year level and robust to heteroskedasticity are reported in parentheses. Statistical significance is denoted: * $p < 0.05$, **$p < 0.01$, *** $p < 0.001$.

Table 6: Investment and Rating by Region

| | (1) North | (2) South | (3) North | (4) South |
|---|---|---|---|---|
| Rating | 0.227** | 0.458** | 0.250** | 0.631** |
| | (2.77) | (2.82) | (2.73) | (3.23) |
| *Lag* Rating | 0.176* | -0.042 | 0.173 | 0.122 |
| | (2.11) | (-0.22) | (1.81) | (0.54) |
| N | 52,980 | 18,954 | 42,123 | 13,877 |

Notes: Data are firm level and annual from 2009 to 2019. The dependent variable is the year-on-year change in tangible fixed assets, scaled by total assets. The dummy variable *Rating* equals 1 if in year $t$ firm $i$ received the Legality Rating for the first time, and 0 otherwise. All estimated equations include fixed effects relative to year, firm legal status, and region of the firm's headquarter, and yearly change in sales, profit rate, and wage bill, and sector (2-digit level) dummies. Under the heading South (North) we report results for the sample of firms whose headquarter is located in the South (North) of Italy. The t-statistics relative to clustered standard errors at the municipality×year level and robust to heteroskedasticity are reported in parentheses. Statistical significance is denoted: * $p < 0.05$, **$p < 0.01$, *** $p < 0.001$.

Figure 1: Legality Rating by Region

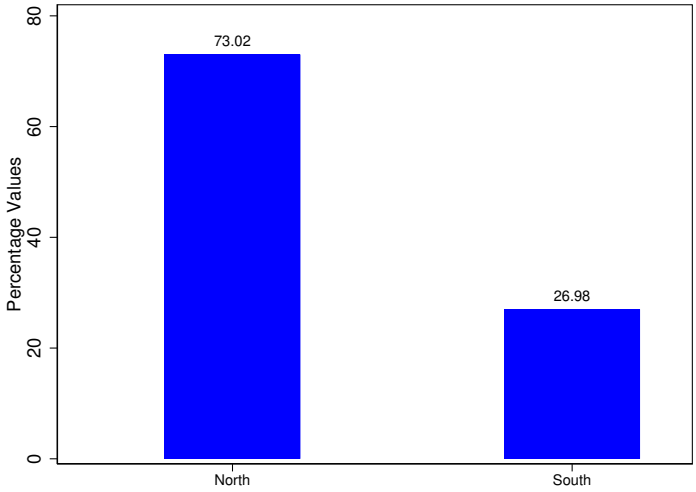


Figure 2: Legality Rating by Sector