Fear of the Mafia, Business Environment, and Liquidity Transfer

Organized crime represents a relevant threat to countries worldwide and use its coercive power to impose a state of fear. Yet, it is difficult to underpin how organized crime's threat can generate distortions in the market. By using the semi-annual publication of the Anti-Mafia Investigative Directive (DIA) on Italian mafia families' surnames over the period 2005-2018 as an exogenous shock, we document that firms located in the same industry and municipality of firms whose top executives happen to have the same surname of Mafiosi (mafia-surname firms) experience a deterioration of operating performance, sales growth, leverage, and WW-index. As a possible mechanism, we show that the fear of mafia can jeopardize firms' relationships and economic transactions in the legal economy. To this purpose, we find that mafia-surname firms receive a greater liquidity extension than other similar firms. Overall, our results shows that the fear of Mafia has relevant consequences for the real economy.

1. Introduction

Organized crime[1] exerts a disruptive influence on the legal economies of countries all over the world[2] through the use of extreme violence, corruption of public officials, penetration of the legitimate economy (e.g., through money-laundering) and interference in the political process (Kenney and Finckenauer 1995; Levi, 2002), as well as the racketing of coercive private protection to landowners and businesses (Gambetta, 1993; Michalopoulos and Papaioannou, 2013; Acemoglu et al., 2020).[3]

Organized crime has a tight control on local territories (Acemoglu et al., 2013; 2020; UNICRI, 2016; Alesina et al., 2018; Le Moglie and Sorrenti, 2020)[4] and it represents a *de facto* parallel authority structure that exercises unique state-like functions such as the policing and enforcement of contracts to regulate illicit transactions among criminal organizations (e.g., Gambetta, 1993; Volkov, 2002; Koivu, 2016). Prior studies have documented that Mafia can distort the functioning of the market (Pinotti, 2015a,b; Ferrante et al., 2021), increase the cost of funding (Bonaccorsi di Patti, 2009), hamper foreign direct investments (Daniele and Marani, 2011), facilitate the misallocation of public funds (Barone and Narciso, 2015; Daniele and Dipoppa, 2017), and affect firms' revenues (Mirenda et al., 2022). What also emerges from the existing studies is that the presence of firms related to Mafia in the market reduces marginal returns on

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[1] For the remainder of the paper, we will use the expressions organized crime, criminal organizations, mafia-type organizations, and mafia as synonyms. While the term "Mafia" originated in Sicily it is, however, widely used to indicate other organized crime groups across the globe (Europol, 2013). We instead refer to Mafia from Sicily as "Sicilian Mafia" or "Cosa Nostra".

[2] "More than three-quarters of the world's population live in countries with high levels of criminality, and in countries with low resilience to organized crime" (GOCI, p.12). Asia has the highest level of criminality, closely followed by Africa and America.

[3] Many of these aspects have been included in anti-Mafia laws of some countries, such as the USA, Italy and Hungary (Fijnaut and Paoli, 2004) but are also used by the European police community (Levi, 2002).

[4] According to the UNODC (2011), organized crime's worldwide proceeds accounted for \$2.1 trillion in 2009, with \$1.6 trillion reinvested in the legal economy.

capital and disadvantage peer firms. Indeed, Mafia firms can secure preferential treatment in the award of orders, contracts, and commercial outlets (Chircop et al., 2022). Furthermore, Mafia can benefit from lower cost of inputs because they can get access to goods and services at favorable prices and reduce cost of labour through the evasion of taxes, nonpayment of overtime, and denial of trade union rights (Ravenda et al., 2015). As a result, this causes an increase of the cost of doing business (Arlacchi, 1983), ultimately inducing peers to engage in tax evasion to remain competitive (Chircop et al. 2022).

Differently, we question whether fear of the Mafia can *per se* exacerbate the business environment where firms operate. Organized crime has acquired competitive positions with respect to firms operating within the law by exerting its intimidating power. The strong market-disrupting power of the organized crime[5] is indeed cultivated by the fear that there may be retaliations against those who would oppose its criminal activities. Indeed, Mafia penetrates civil society with a pervasive climate of fear, leading even to apathy and depoliticization of the citizen body and reducing the confidence in the rule of law (Siebert, 2003). In this paper we argue that the intimidation effect and threat perpetrated by Mafia presence can also exert negative externalities on firms' business environment by deteriorating their mutual confidence. In turns, this can hamper firms' profitability and growth. Prior studies maintain that trust is in fact an important ingredient for stimulating economic growth as it triggers greater investment and other economic activity.[6] Indeed, firms in high-trust societies tend to produce a higher output than in low-trust societies

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[6] According to Arrow (1972, p. 357) "virtually every commercial transaction has within itself an element of trust, certainly any transaction conducted over a period. It can be plausibly argued that much of the economic backwardness in the world can be explained by the lack of mutual confidence."

because they devote less costs and time for monitoring, enforcing, and protecting themselves from being exploited in economic transactions (Knack and Keefer, 1997) .

From an empirical viewpoint, we test our hypothesis by focusing on Italy that represents an ideal setting for this analysis as it is characterized by a high presence of several criminal organizations (mainly *Sicilian Cosa Nostra, Neapolitan Camorra,* and *'ndrangheta*) dating back to the nineteenth century.[7] It is in fact estimated that these organizations have profoundly damaged Italy's local economic development leading to economic losses in terms of GDP and productivity up to around 16% over a thirty-year period (Peri, 2004; Albanese and Marinelli, 2013; Pinotti, 2015a,b). For the identification strategy, we consider changes in peer firms' economic outlook triggered from an external shock induced by the disclosure of information on new mafia-type organizations' members. We make use of the semi-annual reports on mafia-type organizations published by judiciary police – the Anti-Mafia Investigation Directorate – under the Department of Public Security of the Ministry of the Interior in Italy over the period 2005-2018. The Anti-Mafia Investigation Directorate also known as the DIA is an Italian multi-force investigatory body established in 1991 which operates under the Department of Public Security of the Ministry of the Interior. Its main tasks are to conduct preventive investigations into activities relating to organized crime, as well as investigations connected exclusively to crimes of mafia association. Every six months, the Minister of the Interior reports to Parliament the information related to the activities carried out and the results achieved by the DIA. Contextually, the DIA discloses a detailed report with an updated granular picture of the criminal organization's exponents operating on the Italian

[7]According to the Law 646/82 Article 416-bis mafia organizations ('associazione a delinquere di stampo mafioso') are defined as those groups that "exploit the power of intimidation granted by the membership in the organization, and the conditions of subjugation and omerta that descends from it, to commit crimes and acquire the control of economic activities, concessions, authorizations, and public contracts".

territory from the period 1992 up to the current year. The DIA report is also discussed in the Italian Parliament by the Ministry of Interior who also writes a report on the DIA's investigation activities. All reports are advertised on the Ministry of Interior's webpage. Furthermore, information included in the DIA reports receive an extensive media coverage (major national and local tv channels, YouTube, radio, local and national newspapers).[8] From the DIA reports, we extrapolated all the surnames of mafia clan members that we then matched with the top executives' surnames of the firms retrieved from Orbis-Bureau Van Dijk. Finally, we collected the financial data for a large sample of Italian firms for the period of 1999-2018 from AIDA (Analisi Informatizzata delle Aziende – Computerized Analysis of Firms), the Italian Bureau Van Dijk database.

Next, we shift our attention to inter-firm relationships in order to underpin possible mechanisms through which the fear of Mafia can create distortions in the market. Specifically, we consider whether the presence of at least a firm whose top executives' surnames happen to be the same as those of Mafiosi (members of organized crime' clans or families) disclosed by DIA reports deteriorates the economic outlook of peer firms in its municipality (NUTS 3 level) and its industry (using 4-digits NACE Rev.2 classification).[9] We specifically employ a difference-indifferences approach to compare the change in economic outlook of peers (i.e., companies in the same municipality and industry as a Mafia-surname firm) with the change in the same feature of nonpeers (i.e., companies in the same municipality but in a different industry and companies in municipalities without a Mafia-surname firm). The idea is to test whether peer firms (the treatment

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[8] See for example: https://www.interno.gov.it/it/sicurezza-relazione-semestrale-dia-sulle-infiltrazioni-mafiose; https://www.interno.gov.it/it/notizie/relazione-dia-ii-semestre-2020-interessi-delleconomia-criminale-nel-perdurare-dellemergenza-sanitaria;https://www.youtube.com/watch?v=hMuNcjmBHp8&t=13s; https://www.youtube.com/watch?v=oOTQQP7A_DE

[9] Here, as in the remainder of the paper, we use the expression "mafia-surname customers" or "mafia-surname firms" to indicate the firms whose top executive's surname happened to be the same as that of Mafiosi. We also use "mafia surnames" to indicate surnames that happened to be the same as those of Mafiosi.

group) experience a change in their economic outlook after the identification of a mafia-surname firm in their municipality and industry (subsequently the disclosure on mafia clan's members by DIA reports.) We argue that a significant effect exerted by mafia-surname firms on their peers can be attributed to the fear of Mafia. Indeed, mafia-infiltrated firms should be able to deteriorate the business environment where they operate regardless the disclosure of mafiosi by DIA reports.

Our empirical setting is supported by worldwide anecdotal evidence that indicates that people perceive a surname as a credible signal of mafioso identity (Smith and Varese, 2001), which can therefore exert an intimidating effect on others. There are several examples of individuals using mafia surnames, although never members of mafia-type clans, to extort money or gain benefits from others all over the world. [10] Similarly, we question if individuals with a mafia surname could be considered as a legitimate member of mafia organizations particularly in the circumstances where there could be more asymmetric information regarding their real identity. From a theoretical viewpoint, we draw on the behavioral finance literature that has extensively documented that individuals' probabilistic perceptions and judgments are subject to various systematic errors (see, for example, Benjamin, 2018, for a review). Among them, a representativeness heuristic bias is associated with the tendency to judge as likely events that are merely representative, resulting in judgment errors regarding the probability of an outcome (Kahneman and Tversky, 1972; 1973). In finance it is not in fact unusual that a lender may assess the borrower's creditworthiness based on the extent to which the borrower reflects the essential characteristics of a stereotyped group (Baker and Nofsinger, 2010). Furthermore, there is a well-documented body of management literature

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[10] For example, according to the policy report, Salvadore Badalamenti, whose surname happened to be the same as that of a well-known Sicilian Mafioso, Tano Badalamenti, managed to extort money from entrepreneurs in a Piedmont village in the North of Italy (Smith and Varese, 2001). These impostors (people who claim to be Mafiosi but are not in reality, or people who claim to be protected by Mafiosi but are not) try to pass as real Mafiosi by using mafia surnames to benefit from the mafia reputation with the aim of extrapolating rents and taking advantage of others.

which argues that individuals tend to interact with each other following heuristic rules for information gathering and analytical cognitive elaboration in uncertain environments (e.g., Busenitz and Barney, 1997; Kahneman, 2002; Bingham et al., 2007; Bingham and Eisenhardt, 2011; Kahneman, 2011; Guercini et al., 2014).

Several key results emerge from the analysis. Using this research design, we find that peer firms experience an economically significant reduction in operating performance and sales growth by respectively % 1.2%, 1.7%,. Similarly, we find a decrease of peers' long-term leverage and financial constraints measured by Whited Wu index (WW-index) by 0.4% while they exhibit a significant increase of financial constraints by 0.4%. Chircop et al (2022) find similar results in magnitude as concerns the improvement of peers' performance because of the removal of mafia-related firms from the market following anti-Mafia police actions. This suggests that fear of the Mafia generates an impact on the market that is comparable to those of mafia-related firms.

We rule out alternative explanations for our results. We mitigate possible concerns related to unobservable changes in the industry in a specific municipality and year by controlling for Region*Industry*Year FEs. Then, we rerun the analysis by excluding large peers' clusters whose economic performance is more likely to be affected by cofounding factors rather than mafia-surnames firms (e.g. fiercer competition). To further corroborate our interpretation of the results, we verify whether the bias induced by mafia surnames is more severe when there could be more information asymmetry on top executives' real identity. On this respect, we argue that this phenomenon is particularly accentuated in contexts where there could be more uncertainty related to top executives' identities such as outside the regions where mafia organizations originate. In those regions, it is in fact more likely that real Mafiosi are well-known and thus the behavioral bias should occur with less probability. Furthermore, as highlighted by Chircop et al. (2022) the focus

on Northern and Central Italy allows us to mitigate the possibility that we consider as non-Mafia firms, firms that are instead really infiltrated by Mafia but have not yet been detected by the police. This is because the Mafia's presence is much less pervasive in Central and Northern Italy, compared to Southern Italy (Gratteri and Nicaso, 2007). Then we also rerun the analysis by removing the firms with top executives whose last name matched one of those in the list of the family clans operating in the center and north and who was born in Calabria. These are mafia surnames could be related to *'ndrangheta* clans, which consist of strong family ties rather than of affiliation ties (Mirenda et al., 2022). Finally, we check the robustness of our results by running a set of placebo and dynamic tests to corroborate the interpretation of the baseline results. Our results remain robust to all these tests.

As a mechanism through which the fear of Mafia can distort firms' interactions, we show that mafia-surname firms receive additional liquidity resources from trade partners. We specifically hypothesize that individuals can be intimidated by the possibilities of threatening and violent retaliations by these trade partners under the presumption that they could be associated with mafia businesses (even if there is no direct evidence that they collude with them). Consequently, suppliers may attribute more bargaining power to customers whose top executive has a mafia surname and offer them a greater liquidity via trade credit compared to other customers. The focus on trade credit to detect how mafia fears can distort economic transactions between firms is motivated by various reasons. *First*, according to previous studies, suppliers tend to extend trade credit, which consists of having a larger share of goods sold on credit, when they deal with influential buyers (Fisman and Raturi, 2004; Giannetti et al., 2011; 2021; Klapper et al., 2012; Fabbri and Klapper, 2016; Chod et al., 2019). Second, suppliers experience an information advantage over traditional lenders on both customers' creditworthiness and business condition (Petersen and Rajan, 1997).

They also have the capability to enforce repayment of credit under the threat of stopping the supply of intermediate goods to their customers (Klapper et al., 2012). This means that suppliers' lending decisions are less likely to be affected by monitoring issues or by a lack of information on buyers' businesses. Therefore, our setting allows us to better disentangle the effect of mafia surnames on firms' supply of liquidity. Finally, top executives are known to exert an influence on contract terms of trade credit (Intintoli et al., 2017).

In line with our conjecture, our findings shows that mafia-surname firms receive greater trade credit extension in the form of increasing levels of payables – i.e. amounts due to suppliers for goods or services received on credit which is a measure widely used in the literature (see, for example, Love et al., 2007; Shenoy and Williams, 2015; Zhang, 2019).[11] Specifically, they experience an increase of the ratio of account Payables to Cost of goods *(Cogs)*, *PtC*, by six percentage points (one fifth of the median value of *PtC* for the entire sample), which corresponds to an average payment delay of about 23 days for mafia-surname customers after the disclosure of the DIA reports compared to the case in pre-DIA report years.

We also find that mafia-surname firms receive more trade credit extension in northern and central regions, and therefore outside the regions where mafia families are generally rooted. In northern and central regions, entrepreneurs are less likely to know the real identity of Mafiosi and, thus, are more subject to the behavioral bias phenomenon. Then, we also show that the effect associated with mafia surnames is stronger in provinces of northern and central regions with a greater infiltration of mafia-type organizations in the economy (Transcrime, 2015).[12] In these provinces the effect due to the perceived threat should be stronger.

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[11] We find consistent results when substituting *Payables to Cost of goods* with a broader ratio such as *Payables to Sales*.
[12] Regions are NUTS2 regions, while provinces are NUTS3 regions.

Last, we show that the effect of mafia surnames prevails for customers dealing with suppliers offering services and differentiated products. These suppliers provide unique or highly customized inputs tailored to the specific needs of the buyer, in this way making both undesirable suppliers and customers difficult to substitute.

We rule out alternative explanations for our results. We mitigate possible concerns related to omitted variables associated with the characteristics of top executives and board of directors. Next, we run two tests to alleviate the possibility that our findings are driven by top executives being really connected to mafia-type organizations or pretending to relate to mafia-type organizations by considering media attention and social capital.

Results on trade credit are also robust to a variety of tests for sample selection criteria, endogeneity concerns, different sets of control variables, and alternative variables' specifications. We also address potential selection bias by employing a matching technique to construct suitable control/treatment samples for the comparison of trade credit mechanisms. Next, we rerun the analysis using a three-year window setup, an alternative treatment' definition, and a subsample of firms without top executives' turnover.[13] We also consider as an alternative dependent variable the abnormal deviations of payables to cogs ratio from the provincial and industrial average values as an alternative dependent variable. Our main findings remain robust to all these alternative specifications.

Moreover, we check the robustness of our results by running a set of placebo and falsification tests to corroborate the interpretation of the baseline results as evidence of the bargaining power of mafia reputation on trade credit supply. Our results confirm that the effects observed for mafia-

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[13] Top executives that cover this leading role since the first year of observations.

surname firms are not driven by sample variation. Furthermore, we test the validity of our quasi-natural experiment by verifying whether firms' trade credit reversely affects the likelihood that their top executives' surnames are disclosed by the DIA report as mafia surnames. Finally, we show that our results persist when we exclude mafia surnames related to *'ndrangheta* clans and firms in the construction sector where mafia are typically more active (Transcrime, 2015).

Our article contributes to several strands of literature. First, we add to the growing body of literature emphasizing the pervasive impact of organized crime for the economy and society. Specifically, increased attention has been devoted to macro-effects (although difficult to investigate)[14] associated with the distortion in the functioning of the market due to criminal organizations' infiltration in the economy. The majority of previous studies has mostly examined the effect of organized crime's investment in the legal economy at the aggregate level (Peri, 2004; Bonaccorsi di Patti, 2009; Daniele and Marani, 2011; Albanese and Marinelli, 2013; Barone and Narciso, 2015; Pinotti, 2015a,b; Daniele and Dipoppa, 2019; Le Moglie and Sorrenti, 2020; Ferrante et al., 2021). Recently, Mirenda et al. (2022) conduct an analysis at the firm level, finding that firms more exposed to mafia infiltration experience a significant rise in their own revenues. Focusing on peers' businesses. Chircop et al. (2022) show that the removal of Mafia firms following Italian anti-Mafia police actions these actions reduce peers' tax avoidance.

Taking a different trajectory, this study represents the first attempt to underpin to what extent firms' economic behavior can be distorted because of the perceived threat of coercive actions from mafia-type organizations. Specifically, we investigate the presence of negative externalities associated with a state of fear imposed by mafia-type organizations due to their coercive power

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[14] Direct costs refer to the resources i) deployed in the fight against criminal organizations and ii) directly subtracted from the economy by mafia-type organizations (e.g., through thefts, robberies, or extortions) (Mirenda et al., 2022).

and violence. To this purpose, we explore how and to what extent mafia-type organizations' bargaining power can jeopardize peer's economic outlook. Then, we show how mafia fear can alter relationships between firms and their commercial credit transactions.

Second, we offer new insight on the explanations related to trade credit (Klapper et al., 2012; Murfin and Njoroge, 2015; Barrot, 2016; Fabbri et al., 2016; Breza and Liberman, 2017; Coricelli and Frigerio, 2019; Giannetti et al., 2021; Gofman and Wu, 2022). We complement this line of research by documenting the importance of heuristics between supplier and customers relationships as non-financial reason for trade credit.

Third, we offer new evidence on the importance of heuristics and judgment biases for the correct functioning of the market, in general, and financial transactions more in details. While prior studies have mainly focused on credit cycle and financial markets (e.g., Kahneman and Tversky, 1972; 1973; Gennaioli and Shleife, 2010; Bordalo et al., 2016, 2018), as a distinguishing feature, we also show that heuristics matters for firms' economic relationships.

This paper is organized as follows. Section 2 describes the institutional setting, and Section 3 presents the data and methodology. Section 4 discusses the main results while Section 5 focuses on trade credit as a mechanism through which mafia fears can distort market functioning. Section 6 rules out alternative explanations. Finally, Section 7 concludes the paper.

2. Institutional setting: Mafia-type organizations in Italy

Italy is home to a complex and well-branched system of criminal activities managed by mafia-type organizations, which encompasses three major organizations: *Sicilian Mafia or Cosa Nostra –* originated from the Sicily region; ii) *Neapolitan Camorra –* originated from the Campania region; and iii) *'ndrangheta –* originated from the Calabria region. Although all mafia-type organizations

expanded their criminal activities to the more productive and profitable regions, *'ndrangheta* still dominates the North-West, whereas the *Sicilian Cosa Nostra* and *Neopolitan Camorra* appear to be more active in Central Italy (Mirenda et al., 2022) (Figure 1). Furthermore, all these mafia-type organizations are seen as a threat to the European Union (EU) and are widely present in the continents of North and South America, and Australia, as well as the South African region (Europol, 2013). For example, *'ndrangheta* has highly infiltrated the formal economy and banking sectors to launder their illicit proceeds, such as in the UK or Germany (GOCI, 2021). Although Italy is one of the countries with most powerful crime groups in the European continent, like Spain, Montenegro, Albania and Serbia, among others, it is however characterized by moderately high resilience to organized crime due to engagement in cooperation with the international community, including through cross-border judicial and law enforcement cooperation (GOCI, 2021).[15]

[Insert Figure 1 about here]

Even though mafia-type organizations are different from one another with respect to economic and social conditions, and history, they do however share several common features among themselves (Acemoglu et al., 2020). Indeed, criminal organizations appear to emerge alongside a weak state, a state's failure to preserve the monopoly of coercion, and widespread lack of trust in the institutions (Koivu, 2016; Acemoglu et al., 2020). Particularly in Italy, criminal organizations have been traditionally aggressive in holding the monopoly in violent activities (Pinotti, 2015b). In this context, mafia-type organizations manage to find a certain consensus in a segment of the population by providing alternative capital and jobs in more disadvantaged areas (Gambetta and Reuter, 1995; Le Moglie and Sorrenti, 2020).

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[15] Like the United States, although Italy has robust mechanisms to counter organized crime, it continues to be afflicted by pervasive illicit economies (GOCI, 2021).

3. Data and Methodology

3.1 Data

We collect data from multiple sources to explore the effect of mafia surnames on trade credit supply. The main source of information for mafia surnames is the semi-annual DIA report, which provides an updated granular picture of the criminal organizations' exponents operating on Italian territory. This includes information drawn from judicial and investigative evidence on the mafia-type organizations. In particular, the semi-annual report contains the surnames of the members of the mafia-type clans that are active on the territory.[16] We collect 5,235 mafia surnames from the DIA reports over the period 1992-2018. Then, we link these mafia surnames with the top executives' surnames retrieved from Orbis.[17] We exclude from the sample all the firms whose top executives' surnames are associated with mafia surnames since the beginning of the entire sample period as we cannot estimate any differential effect due to disclosure in the DIA reports for them.[18] Furthermore, this allows us to mitigate the possibility that a firm is established in a particular industry and municipality because of a mafia-surname firm's presence. Our final sample includes

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[16] See Figures A.1 and A.2 for an example of DIA report.

[17] After carefully investigating the data, we have developed the following ranking hierarchy to identify firms' Top Executives in Orbis: 1) Sole Administrator; 2) Chief Executive Officer; 3) Chairman/President of the Board; 4) President of the Management Board; 5) General Manager or Managing Director; 6) Administrator; 7) Director; and 8) Sole Partner. For each firm we consider the Top Executive with the highest title following our eight-part hierarchy. We, however, highlight that there is rarely an overlap between the above titles for the same firm. Overall, the result is that the first three ranks account for almost 65% of the total observations available in Orbis.

[18] We found that 57,032 firms, corresponding to around 10% of the firms in our sample, have top executives with mafia surnames since the beginning of our sample period. In an unreported t-test available upon request, we find that firms whose top executive has a mafia surname since the beginning of the sample period have a *PtC* value (mean: 0.747) significantly higher (p-value 0.0000) than those firms whose top executive's surname has been associated with new Mafiosi during the sample period (mean 0.668). The difference is even larger (p-value 0.0000) with respect to firms whose top executive does not have a mafia-surname (mean: 0.600). As expected, well-established mafia surnames exert a stronger effect on *PtC* than new mafia surnames.

7,647 firms whose top executives have a mafia surname (matching 3,357 mafia surnames from the DIA reports).

We retrieve accounting data on Italian firms from Aida - Bureau Van Dijk that contains balance sheet data for most of the limited liability firms in Italy (*Società per Azioni* and *Società a Responsabilità Limitata*).[19] For our analysis, we only consider firms in the nonfinancial business economy, also excluding primary industries and utilities because of their peculiarities. Based on the NACE Rev.2 classification, we specifically drop the following sectors: agriculture, forestry, and fishing (section A); mining and quarrying (section B); utilities (sections D and E); financial and insurance activities (section K); public administration, education, health, and entertainment (sections O to R); and other service activities (section S). We also exclude from our sample any firms that have been seized by the Italian government and put under judicial administration in the period of investigation as they could collude with the organized crime. By dropping them from the sample, we can better underpin the representative bias associated with mafia surnames.[20] Following prior studies (e.g., Calamunci and Drago, 2020; Calamunci, 2022), we detect firms subject to legal procedures from AIDA and dropped them from the sample.[21] In addition, we removed from the final sample firms with zero values for both account payables and account receivables since we are aware that missing data on trade credit at the firm level could sometimes be recorded as zeros (Coricelli and Frigerio, 2019). The final sample encompasses 2,191,466

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[19] Under the Italian law, it is mandatory for firms to file and deposit annual reports with the local Chamber of Commerce.

[20] Although we cannot exclude with certainty that there are firms related with mafia-type organizations in our sample, we mitigate such an issue by removing firms under judicial administration.

[21] We found 238 firms in the following AIDA categories: court ordered administration, court ordered liquidation, court ordered seizure, court order of cancellation.

observations for 393,050 firms spanning from 2000 to 2018, with complete accounting and top executives' information.

As reported in Table 1, most firms are distributed within the following activities: manufacturing (19.3%), construction (17.2%), wholesale and retail trade (25%), real estate activities (15.2%), and professional, scientific, technical, and other activities (12.1%). As shown in Table 1, most of the firms whose top executives share the surname with mafia clans' members belong to similar industrial sectors, with a higher percentage in the wholesale and retail trade sector (30%). While firms are mainly located in Northern and Central regions (around 57%), most firms with mafia surnames are instead located in Southern regions (65.5%).

[Insert Table 1 about here]

3.2 The Research Design

To explore the effect of mafia-surname firms on peer firms, we implement a difference-in-differences strategy that relies mainly on three major factors: (i) accounting and governance information for the Italian firms over the entire territory; (ii) the exogeneity of the semi-annual report issued by DIA on mafia-type organization; and (iii) identification of top executives with surnames in common with the members of mafia clans. According to this, we build the variable *Mafia-surname firm* that is a binary dummy equal to one for firm *i* whose Top executive: i) has the same surname as those of Mafiosi disclosed by DIA reports from year *t* onwards; and ii) was born in one of the regions of the mafia-origins regions (Sicily, Apulia, Campania, Basilicata, or Calabria); and zero otherwise. The birth-place criterion allows us to capture the degree of asymmetric information that could affect our estimation. We argue that the behavioral bias associated with mafia surnames is likely to be stronger for top executives born in the regions where

mafia families are rooted.[22] Then, we build a dummy *Mafia-surname Peer* which is equal to one

if there is at least one Mafia-surname firm in the municipality and industry NACE 4-digit, and zero

otherwise. Next, in our difference-in-differences design we compare the change in economic

outlook of peer firms (the treatment group) to the change in the same features of other firms in

other industries or municipalities without mafia-surname firms in that year (the control group).

The baseline equation is given as the following:

$$Y_{i,t} = \beta_0 + \beta_1 \text{Mafia-surname Peer}_{i,t} + \beta_2 W_{i,t-1} + \delta_i + \eta_t + \varepsilon_{i,t} \qquad \text{Eq. (1)}$$

where the dependent variable *Y* is alternatively *Operating Performance*, measured as the firm's net

income before depreciation, taxes, and extraordinary items (standardized by total revenues);

property, plant, and equipment, *Sales Growth*, *Long-term Leverage* and *WW-Index*. W is the vector

of firm characteristics at time t-1 including Size, Age, and Cash (see Table A.1 in the Appendix

for a detailed description of all the variables employed in this study). All the financial ratios of our

interest are winsorized at 1%. We also incorporated firm and year fixed effects (F.E.) to avoid a

potential bias from the omission of unobservable firm-specific and time-specific characteristics.

Standard errors are clustered at the municipality level. To ensure that $\beta 1$ does not reflect time-

varying shocks common to firms operating in certain geographical areas and in an industry, we

also include year * region a* industry F.E.. In our analysis, we exclude the cases in which Mafia-

surname Peers = 0 but it was equal to 1 in at least one previous year. Note that in our difference-

in-differences analysis, we consider as the 'treatment year', the year in which the top executive's

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[22] For example, people could preserve the accent from the region of origin as this is a common sociolinguistic phenomenon in Italy. This could facilitate the association of an individual with a specific part of Italy (Cavanaugh, 2005). In a further test, we rerun the baseline model by defining the main variable of interest – mafia surnames – only based on the first criterion: top executives having the same surname as that of Mafiosi based on information newly disclosed by the DIA reports.

surname of a firm is associated for the first time with mafia surnames based on DIA reports. Together with the removal of firms under judicial administration, this reduces the possibility of identifying false negative criminal firms.

Table 2 presents descriptive statistics on the relevant firm-level ratios, while Table 3 shows the correlation matrix for the main variables employed in this study.

[Insert Table 2 about here]

[Insert Table 3 about here]

4. Empirical Findings

4.1 Main findings

In this section, we examine whether and, if so, to what extent the presence of at least one Mafia surname firm in a municipality and industry affects the economic outcome of peers. Panel 4 of Table 4 shows the results for the specification with firm and year F.E., while Panel B reports the results for the specification with year*region*industry F.E.. Regardless of the model specification employed, the coefficient on *Mafia-surname Peers* is always negative and statistically significant with *Operating Performance*, *Sales Growth*, *Long-Term Leverage*, while is always positive and statistically significant with *WW-index*. The effect is also economically significant as peer firms experience an economically significant reduction in *Operating Performance*, *Sales Growth* by respectively % 1.2%, 1.6%. Similarly, we find a decrease of peers' long-term leverage by 0.4%

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while WW-index increases by 0.4%.[23] Similar results are found when estimating Eq. (2) in Panel B, although the effect on *Operating Performance* is half the one found in Panel A.

[Insert Table 4 about here]

In a subsequent analysis, we remove from our sample the largest industrial clusters at the municipality level to mitigate the possibility that our results could be driven by unobservable co-founding factors. We argue that the effect produced by mafia-surname firms on peers should be weaker in the case of the largest industrial clusters where there are multiple players operating in the same industry-municipality. To this purpose, we rerun the baseline model by excluding large peers' clusters (municipality-industry-year) with more than 300 observations (obs). These clusters correspond to 1 municipality over 5000 municipalities which include about 7% of the firms in our sample. Panel C shows the findings that are like those of the baseline model reported in Panel A. Finally, we rerun the baseline model by excluding mafia-origins regions. Specifically, we explore whether the effect of mafia surnames is stronger when there could be more severe asymmetric information regarding top executives' identity. We argue that such an issue could be more relevant for firms located outside the regions where mafia families are generally rooted. In these geographical areas, it is more likely that an individual with a mafia surname can be associated with mafia-type organizations as its real identity is unknown. Furthermore, the presence of firms related to mafia organization is less pervasive in these regions than in mafia-origin regions. Thus, there is less chance to consider as non-mafia firms, firms that are instead really related to organize crime.

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[23] In 2018 (last year of our analysis) the operating profit in the North and Central Regions is about € 41.6 billion, while in the mafia-origins regions is about € 2.5 billion.

Accordingly, we split our sample based on the geographical locations of firms' headquarters. Panel D excludes mafia-origin regions. Again, the results are like those of Panel A.

4.2. Additional tests

We run further tests to corroborate our findings. First, to ensure that our baseline results are not driven by sample variation, we perform a placebo test by randomizing the assignment of treatment (with no replacement) chosen from the sample period between 2000 and 2018 for the matching sample. We estimate the effect of pseudo-treatment with the full set of control variables as presented in the baseline model. We store the estimated coefficient of *Mafia-surname Peers* and repeat this procedure 1,000 times to generate the distribution of the placebo estimates (mean, standard error, and relevant percentiles). Table 5 shows that the estimated coefficient is not significant, suggesting that the baseline findings are not driven by chance or by other omitted firm-level characteristics.

[Insert Table 5 about here]

We perform a dynamic treatment analysis pre- mafia surnames' disclosure by the DIA semi-annual report on the outcome variable across treated and control firms. This analysis enables us to assess whether observed changes to outcome variables already occur prior to mafia surnames' disclosure by the DIA semi-annual report. In this case our results could be capturing a pre-existing trend. Figure 2 presents the results. As shown, we do not find any significant effect for the main variable of interest Mafia-surname Peers in the period before the mafia surnames' disclosure by the DIA semi-annual report. This is consistent with the parallel trend assumption.

Then we also rerun the analysis by removing the firms with top executives whose last name matched one of those in the list of the family clans operating in the center and north and who was born in Calabria. These are mafia surnames could be related to *'ndrangheta* clans, which consist of strong family ties rather than of affiliation ties (Mirenda et al., 2022). This allows us to further mitigate the possibilities that the firms included in our sample are really related to mafia organizations. Table A.2 shows the results.

5. The fear of Mafia and liquidity transfer inter-firms

In this section we explore how mafia fears can jeopardize inter-firm relationships by focusing on trade credi. Section 5.1. presents the empirical setting; Section 5.2. discusses the related findings; Section 5.3. focuses on criminal infiltration and origings, while Section 5.4. deals with hold-up problem. Finally, Section 5.5 deals with robustness checks.

5.1. Empirical setting

In this section of the paper, we explore how and to what extent firms may respond to the perceived threat and fear generated by the potential presence of mafia in related businesses. To test this effect, we investigate whether mafia-surname firms receive additional liquidity resources from trade partners. To this purpose, we compare *PtC* before and after the disclosure of new mafia clans' surnames from DIA semi-annual reports for firms with and without mafia surnames. The equation is given as the following:

$$PtC_{i,t} = \beta_0 + \beta_1 \text{Mafia-surname firm}_{i,t} + \beta_2 \text{Top-Executives-Origin}_{i,t}$$
$$+ \beta_3 W_{i,t-1} + \delta_i + \eta_t + \varepsilon_{i,t}$$

Eq. (2)

where our main dependent variable is *PtC*, or *Payables to COGS* ratio, measures the amount of trade credit extended to firm *i* at time *t* as a percentage of its yearly purchases (proxied by the cost of goods). The main variable of interest in this analysis is *Mafia-surname firm* as defined in Section 3.2. *Top Executives Origin* equals to one if the firm's top executive is born in one of the mafia-origins regions, and zero otherwise. *W* is the vector of firm characteristics at time *t-1* including *Size, Age, Leverage Profitability, Tangibility, Cash,* and *Receivables* (see Table A.1 in the Appendix for a detailed description of all the variables employed in this study). All the financial ratios of our interest are winsorized at 1%. We also incorporated firm and year fixed effects to avoid a potential bias from the omission of unobservable firm-specific and time-specific characteristics. Standard errors are clustered at the province level.

We estimate Eq. (2) based on a full sample-, a matching sample-, and an event study setup. In the matching sample, we consider the possibility that mafia-surname firms may be associated with some fundamental characteristics possibly affecting our estimations. To address this potential selection bias, we employ a matching technique to construct suitable control/treatment samples for the comparison of trade credit mechanisms. Specifically, for each treated firm, we identify the 'treatment year' in which the top executive's surname is associated for the first time with mafia surnames (based on DIA reports). Then, for each treated firm, we select the five closest control firms in terms of their size (total assets) in the year before the treatment year, and their industry and geographical location, i.e., province. By considering firms within the same province and industry we limit the possibilities that firms in the treated and control groups can be exposed to different local supply chain characteristics and conditions. Then we rerun our main regressions in

the matched sample, which consists of the treated firms, i.e., mafia-surname firms, and the matched control firms. We also rerun the analysis using a three-years window setup – to limit the analysis of mafia surnames to window period. Next, we assign zeros to *Mafia-surname firm* if the firm appoints top executive(s) whose surname coincides with that of Mafiosi disclosed by DIA reports. This allows to control for the possibilities that our findings could be driven by top executive's turnover rather than the disclosure of new mafia surnames in the DIA reports.[24] Alternatively, we also refine the sample to only include top executives that have been in charge of the firm since the beginning of the sample period – to exclude the effect of turnover among top executives and isolate the effect of DIA disclosure. This should also mitigate the possibility that our findings are driven by missing information on top executive's turnover.[25] Finally, we employ the *PtC* deviation from the average value of industry-region-year as an alternative dependent variable. This further alleviates possible concerns that firms in the treated and control groups may be exposed to different local industrial conditions.

5.2. Findings

Table 6 implements the identification strategy of Eq. (2) based on different settings: the entire sample (Column 1); the matched sample (Column 2); the three-year window setup (Column 3); alternative definition of the main variable of interest (Column 4); the subsample of firms without top executives' turnover (Column 5); and *PtC* deviation from average values by industry-region-year as an alternative dependent variable (Column 6). Our findings in Table 6 show that firms

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[24] In an unreported test, we also exclude these firms from our sample. The main result holds. The table is available upon request.
[25] As pointed out by Bedendo et al. (2020), Orbis reports the latest available information on the composition of firm's top executives. We retrieve the latest available data on board composition (as of July 2020).

receive greater trade credit supply when their top executives are found to share their surnames with new mafia organizations' members disclosed by DIA reports. Specifically, *Mafia-surname firm* dummy is significantly and positively related to *PtC*. The effect is also economically significant; for example, an increase of 6.3 percentage points in *PtC* (as reported in Column 1) is corresponding to an extension of the payment delay by about 23 days (obtained by multiplying the estimated coefficient by 365). Similar results are found when estimating Eq. (2) based on the matched sample (in Column 2) and the three-years window setup (in Column 3), recurring to an alternative definition of *Mafia-surname firm* (in Column 4), and removing firms with top executive's turnover over the period of investigation (in Column 5). Finally, Column 6 considers an alternative measure on *PtC* which captures the excess value over the cross-sectional peer firms from the same industry and province. Our findings are robust across these settings. In the remainder of the paper, we refer to the specifications in Columns (1) and (2), with the full and matched samples, as the main models.

This result suggests that suppliers may mistakenly link mafia-surname firms with organized crime. As a result, it seems that suppliers are induced to extend more trade credit to these customers to avoid risk consequences stemming from "bad" choices", such as not being complaint with firms that they think to be related to mafia. This finding also mitigates the possibility that customers are aware of the effect induced by their top executives' mafia surnames. In this case, we maintain that they should shorten their payment duration to preserve their reputation although this is could not be even an optimal choice.

[Insert Table 6 about here]

5.3. Criminal infiltration and origins

In this section we explore whether the effect of mafia surnames is stronger when there could be more severe asymmetric information regarding top executives' identity. Thus, we focus on firms located in central-northern regions. This analysis allows also to mitigate the possibility to mistakenly consider false negative mafia firms as previously explained. Consistent with our conjecture, Table 7 shows that the effect of clans' surname disclosure derives from firms located in central-northern regions, while the effect disappears for mafia-origins regions. Interestingly, *Top Executive Origin* dummy is negatively related to *PtC*, suggesting that suppliers have less trust in customers whose top executive is born in one of the mafia-origins regions. Conversely *Top Executive Origin* dummy is positively and significantly related to PtC in mafia-origins regions. A possible explanation could be that payments are in general done on delay in these regions. As for further robustness checks, we rerun the main model for the full and matching samples, only considering the firms located in in central-northern regions.

[Insert Table 7 about here]

As another test, we split these firms according to the level of mafia infiltration in the business at the provincial level. Our expectation is that the behavioral bias is stronger in the provinces where the threat of mafia infiltration in a firm is more credible. For this analysis, we adopt the Transcrime Mafia Index (TMI) which measures the territorial mafia infiltration based on military occupation and the mafia's dominance in the illegal goods and services activities.[26] We use the median of the TMI distribution at the provincial level to distinguish between provinces with and without high mafia infiltration. Table 8 shows that the estimates for *Mafia-surname firm* are only significant in

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[26] The TMI employs the records of those convicted of being in a mafia-type organizations according to Law 646 and art.416- bis, murders ascribed to Mafiosi, city councils dissolved because of mafia infiltration, and assets seized due to organized crime.

Columns (2) and (4) in the case of a *High Mafia Index*, suggesting that the effect of mafia surnames on trade credit extension can only be detected in the provinces with a greater infiltration of mafia-type organizations.[27] Thus, suppliers are more willing to extend trade credit to mafia-surname customers in the provinces where the threat of mafia punishment is perceived as more concrete and probable.

[Insert Table 8 about here]

5.4. Hold-up problems

In this section, we consider whether the effect of representative bias may vary with hold-up concerns which stem from product characteristics (Fee et al., 2006). This is important because if goods are more tailored to the needs of customers, such as differentiated goods, buyers should be less inclined to behave unethically.[28] Furthermore, both suppliers and customers are more likely to be locked-in to a specific relationship in the case of customized goods and services (Giannetti et al., 2011, Fabbri et al., 2016). This implies that suppliers facing high switching costs cannot easily replace existing undesirable customers. Consistently, we expect that the representative bias associated with mafia surnames should be stronger in the case of customers dealing with suppliers of differentiated goods and services that are usually more likely to experience hold-up problems (e.g., Fee et al.,2006; Giannetti et al., 2011).[29]

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[27] Regions are NUTS2 regions, while provinces are NUTS3 regions.
[28] Customers facing high switching costs cannot easily replace existing suppliers to find compliant firms that are eager to allow delayed repayments because of the treat induced by mafia surnames.
[29] Differentiated goods embed multidimensional characteristics, and therefore exhibit highly heterogeneous prices, while standardized goods tend to have a clear reference price listed in trade publications (Giannetti et al. 2011). For this reason, differentiated goods are usually more difficult to liquidate and are tailored to the needs of specific buyer.

We follow Giannetti et al. (2011) to distinguish between suppliers producing *differentiated goods* and *standardized goods*.[30] Then, we consider a firm using a high (low) proportion of differentiated inputs if the share of inputs that comes from sectors producing differentiated inputs is above (below) the median value for the entire sample. We follow the same procedure for standardized inputs. As hypothesized in Section 3, Table 9 shows that the bias associated with mafia surname is stronger for firms dealing with a high proportion of differentiated inputs (and thus a low level of standardized inputs). The result suggests that behavioral bias is stronger in the case of goods that are more tailored to the needs of customers. This attenuates the possibility that costumers replace the existing suppliers with others more eager to allow delayed repayments because of the threat induced by mafia surnames. It also indicates that behavioral bias is stronger for suppliers that cannot easily replace existing undesirable customers.

[Insert Table 9 about here]

5.5. Robustness Checks

Then, we run several tests to corroborate the validity of our quasi-natural experiment. First, we focus on parallel trend and placebo test (Section 5.6.1). Next, we control for the validity of our quasi-natural experiment by checking whether firms' trade credit does not reversely affect the probability of a firm being treated (Section 5.6.2). Finally, we run additional tests for mafia affiliation types, the construction sector where mafia is particularly present, and firm size (Section 5.6.3).

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[30] Rauch (1999) and Giannetti et al. (2011) use the SIC code industrial classification. To run this analysis, we convert the SIC codes to NACE Rev.2 codes (2-digit), and then to the ATECO codes, the Italian industrial classification.

5.5.1 Dynamic treatment analysis and placebo test

We perform a dynamic treatment analysis that examines the timing of a firm's trade credit relative to the timing of the mafia surnames' disclosure by the DIA semi-annual report. This analysis enables us to assess whether observed changes to trade credit extension already occur prior to mafia surnames' disclosure by the DIA semi-annual report. In this case our results could be capturing a pre-existing trend. For the scope, we split the *Mafia-surname firm* dummy into six dummy variables based on the time interval that precedes or succeeds the publication of the DIA reports. If the assumption of parallel trends is violated, we should find that a relationship between the interaction terms of our interest and trade credit extension (*PtC*) already exists before the publication of the DIA report, thus revealing significant coefficient estimates on $Mafia - surname\ firms^{-3+}$, $Mafia - surname\ firms^{-2}$, and $Mafia - surname\ firms^{0}$. We report the results of our dynamic treatment analysis in Table A.3.

Table 10 shows that the coefficient estimates of *Mafia-surname firm* dummies before the publication of the DIA report are statistically insignificant for the entire sample, but also for the subsample focusing respectively on firms located in the central-northern regions and in mafia-origins regions, suggesting no significant differences in pre-trends between the treated and control firms. This indicates that the parallel trends assumption holds (Roberts and Whited, 2013). Therefore, mafia-surname firms' *PtC* increases significantly only after the DIA report's publication on mafia surnames. These results mitigate the reverse causality issues. *Mafia-surname firm* dummies after the DIA release are especially significant in case of central-northern regions consistently with Table 7.

To ensure that our results are not driven by sample variation, we perform a placebo test by randomizing the assignment of treatment (with no replacement) chosen from the sample period

between 2000 and 2018 for the matching sample. We estimate the effect of pseudo-treatment with the full set of control variables as presented in the model. We store the estimated coefficient of *Mafia-surname firm* and repeat this procedure 1,000 times to generate the distribution of the placebo estimates (mean, standard error, and relevant percentiles). Table A.4 shows that the estimated coefficient is not significant, suggesting that the findings are not driven by chance or by other omitted firm-level characteristics.

5.5.2 Probability of a firm being treated

We further check the validity of our quasi-natural experiment by checking whether firms' trade credit does not reversely affect the probability of a firm being treated. We consider as a firm's characteristics the regressors reported in Eq.(1) plus *PtC*. For this analysis, we employ a logit model. We drop the firms from the sample after they became "treated" (e.g., the surname of top executives appears for the first time in the DIA report). Estimation results are shown in Table A.5. Column (1) only considers the variable of interest *PtC*, while Column (2) includes all the other firms' characteristics from Eq.(1). In both Columns (1) and (2), *PtC* does not significantly affect the likelihood of a firm being treated, in this way mitigating reverse causality issues.

5.5.3 Other tests

In further analysis, we explore whether our results also persist when we exclude mafia surnames related to *'ndrangheta* clans, which consist of strong family ties rather than of affiliation ties (Mirenda et al., 2022).

We also rerun the analysis without considering the firms in the construction sector where mafia typically operates (Transcrime, 2015). Table A.6 shows that the main findings for both the

full and matching samples also hold by excluding mafia surnames related to *'ndrangheta* clans and firms in the construction sector.

6. Alternative explanations

This section presents a battery of additional exercises carried out to mitigate alternative stories and to verify our findings on trade credit. First, we account for the possibility that our estimates can be affected by omitted variables related to top executives' and board of directors' characteristics (Section 6.1). Then, we mitigate the possibility that the effect of mafia surnames is driven by the fact that top executives are really connected to mafia-type organizations or pretend to relate to mafia-type organizations by acting like "impostors" (Section 6.2). Finally, we control for the possibilities that top executives' surnames can be typical in certain regions and therefore reflect the general attitude towards individuals coming from those areas (Section 6.3).

6.1 Top executives' and board of directors' characteristics

We account for possible bias due to omitted information on either top executives' or Board of Directors' characteristics. As a further test, we therefore add to the model top executives' specific variables that could affect the usage of firms' trade credit. Specifically, in Columns (1) and (4) of Table 10 we control for age (*Top Executive age*), tenure (*Top Executive tenure*), and an indicator variable that takes a value of one if the top executive is female (*Top Executive female*). Similarly, in Columns (2) and (5) we repeat the estimations using board of directors' characteristics; i) average age of board of directors (*Board of Directors age*); ii) average tenure of board of directors (*Board of Directors tenure*); and iii) percentage of females in the Board of Directors (*Board of Directors female*). The estimates reported in Columns (1-2) and (4-5) of Table 10 are very similar

to those in Table 6, in this way mitigating concerns over omitted variables related to governance and top executives' characteristics.

[Insert Table 10 about here]

We also corroborate our estimates using an alternative set of fixed effects. We specifically consider the possibility that findings could also be affected by unobservable top executives' characteristics associated with their province of origin. In Table 10, we saturate our model by including top executives' provincial fixed effects. Columns (3) and (6) of Table 8 shows similar results to Table 6.

6.2 Real Mafiosi or "impostors": DIA reports' coverage and social capital

In this section we rerun our model by considering the number of times that mafia surnames appear in the DIA reports. This test should further mitigate the eventuality that top executives with mafia surnames are really related to mafia families. Indeed, we expect that media coverage on surnames only matters in the case of the representative bias phenomenon. Firms that are really connected with mafia organizations can extrapolate rents from other firms by way of violence or their intimidating power, regardless of mafia surnames' media attention. Specifically, we predict that the effect of *Mafia-surname firm* dummy should be stronger for mafia surnames that appear multiple times in the DIA reports, and thus, receive more media attention. For this analysis we only focus on central-northern regions where the effect of mafia surnames is more predominant. Consistent with our expectations, Table A.7 shows that *Mafia-surname firm* has a stronger impact on *PtC* for high cited (above the median) mafia surnames than for low cited (below the median) mafia surnames in the DIA reports.

Next, we run an additional analysis to verify whether our findings are driven by the local level of social capital which could offer an alternative explanation to our phenomenon (e.g., Levine et al., 2018). We argue that mafia-surname firms should be able to extrapolate rents from other firms by pretending to be related (or being related) to mafia-type organizations in areas with a low level of social capital. For this test, we draw on the concept of social capital implemented by Guiso et al. (2004) which encompasses two indicators at the provincial level: the efficiency of law enforcement,[31] and civic engagement measured through voter turnout at referenda. Our results in Table 11 do not show any statistically significant difference between the coefficients of *Mafia-surname firm* dummy for firms in provinces with high and low levels of social capital. This suggests that mafia surnames' effect does not emerge in provinces with weak law enforcement bodies and low resilience to organized crime.

[Insert Table 11 about here]

6.3 Excluding typical regional surnames

A further concern could be related to the fact that our main results could be affected by the general attitude towards people with a surname that is typical (more common) in mafia-origins regions or central-north regions. Although we control for the top executive origin as a regressor in the main model to mitigate such an issue, we run a further test to detect whether our findings are driven by surnames that are more frequent in certain geographic areas. Specifically, we rerun Eq. (2) after excluding from the sample all surnames that are typical in mafia-origins regions (but not in central-

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[31] Data are retrieved from ISTAT. The court inefficiency reflects the mean number of years it takes to complete a first-degree trial by the courts located in a province. We identify provinces with Low (High) Judicial Inefficiency if the average number of years to complete the first-degree trial for all the courts located in those provinces is below (above) the national median value.

northern regions) in Columns (1) and (3) of Table 10. Secondly, we additionally exclude surnames that are typical in central-northern regions (but not in mafia-origins regions) in Columns (2) and (4) of Table 12. For this analysis, we define 'typical surnames' as those belonging to the last decile of the distribution of all the surnames in our sample, considering mafia-origins regions and central-northern regions separately. Table 12 shows that the results are still consistent with those of the model in Table 6 for both the full and matching samples.

[Insert Table 12 about here]

7. Concluding remarks

In this work, we intend to shed new light on organized crime's disruptive effect on the correct functioning of the economy, mainly caused by its tendency to control society using coercive power and by imposing a state of fear. We specifically offer new evidence on the fact that the perception of the threat of organized crime may deterioate the business environment and as a result also the economic transactions between firms. We test this by using the semi-annual publication of the Anti-Mafia Investigative Directive (DIA) on Italian mafia families' surnames over the period 2005-2018 as an exogenous shock. Our findings show that firms located in the same industry and municipality of firms whose top executives happen to have the same surname of Mafiosi experience a deterioration of operating performance, sales growth, leverage and WW-index. Our results are robust to several tests.

To show in depth how mafia fear can jeopardize inter-firm relationships, we then focus on liquidity transfer between firms. On this matter, we argue that firms whose top executives could be associated with Mafiosi based on their surnames are forged with bargaining power with respect to their suppliers and a result receive more trade credit. . Our findings confirm that mafia-surname

firms receive a payment delay from their suppliers.. Quantitatively, mafia firms experience greater

trade credit extension (e.g., a higher *payable to cost of goods* ratio) of about six percentage points,

which corresponds to 23 days of payment delay in the post-DIA report's disclosure. This effect is

more pronounced in central-northern regions; and particularly in the provinces with a high mafia

infiltration where the threat of mafia punishments is more likely. The results of this study are robust

to endogeneity concerns, different sample selection criteria, omitted variables related to top

executives' and board of directors' characteristics, alternative treatment's specification, validation

and placebo tests, and the use of different empirical specifications. Finally, we find evidence of a

strong positive association between greater *PtC* and level of variation in receivables over sales,

which could help them to strengthen their customer base. Conversely, we observe that a greater

PtC is associated with a drop in labor market variables. However, we find that mafia firms also act

as liquidity providers for other firms by offering greater payment delay. Our findings suggest that

mafia reputation can, *per se,* jeopardize firms' economic decisions and alter the correct functioning

of the competitive forces in the industrial markets.

Our study offers important suggestions to policy makers. First, policies against criminal

organizations should also aim to weaken the roots of the social consensus achieved through mafia

investment in the legal economy. Policy makers could, for example, consider strengthening Anti-

Mafia Law Enforcement, but also promoting initiatives aimed at consolidating the relationship

between institutions and citizens so that communities are not left vulnerable to criminal groups.

Then, one possibility could also be to further strengthen and diffuse the use of anti-mafia

certification which provides a guarantee that the entrepreneurs and family members living with

them have not been convicted of mafia-type crimes, criminal association, or other serious crimes.

In some countries (e.g., Italy) such certification is now only mandatory for firms that intend to

participate in public contracts and other suppliers of services provided by Public Administrations. More information from the authorities and industrial associations on the initiatives aimed at contrasting mafia activities and infiltration would certainly reduce the intimidating power of mafia-type organizations. Future research avenue might consider additional mechanisms through which the fear of mafia can deteriorate the correct functioning of the market. Additional attention could also be diverted to the supplier-customer relationship characteristics to underpin further possible mechanisms associated with criminal organizations.

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Figure 1

This figure shows the geographical distribution of the Transcrime Mafia Index (TMI), indicating mafia presence at the provincial level.

Mafia Index

(20.030001,101.57]
(8.1400003,20.030001]
(2.1900001,8.1400003]
(1.08,2.1900001]
(.68000001,1.08]
(.30000001,.68000001]
(.15000001,.30000001]
[.01,.15000001]
No data
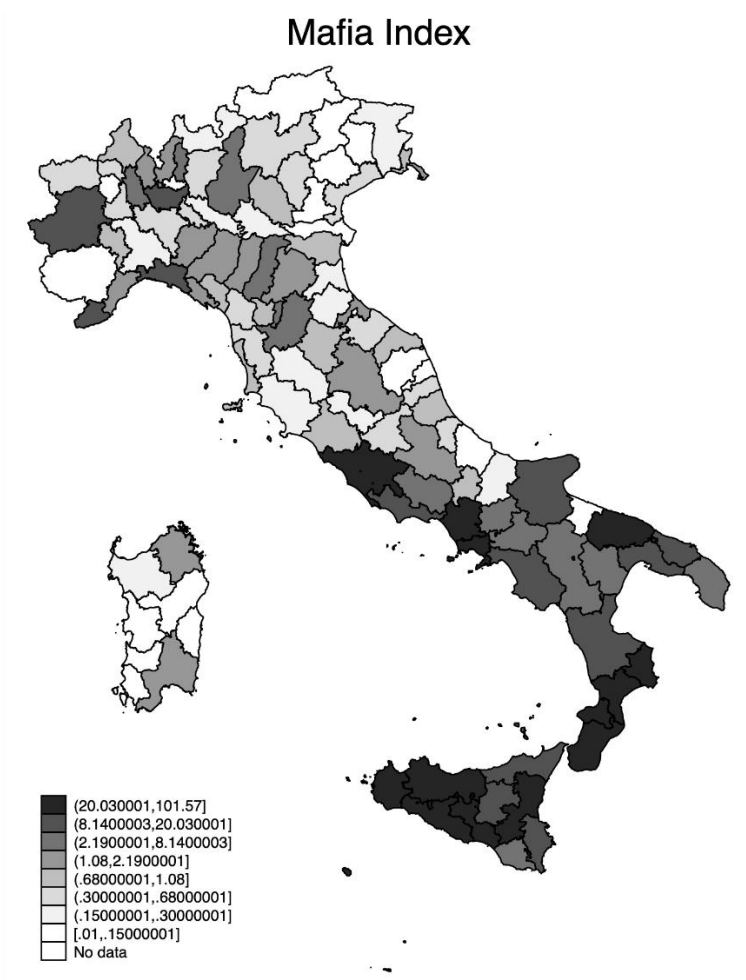
Figure A.2 – Dynamic treatment analysis

This figure reports the dynamic treatment analysis of the results in Table 4 Panel A. The dependent variables are *Operating Performance*, *Sales Growth*, *Long-term Leverage* and *WW Constrained*. Standard errors are clustered at the municipality level and are reported in brackets. [***], [**], and [*] denote statistical significance at the 1%, 5%, and 10% levels, respectively. Variables' definitions are provided in Table A1.
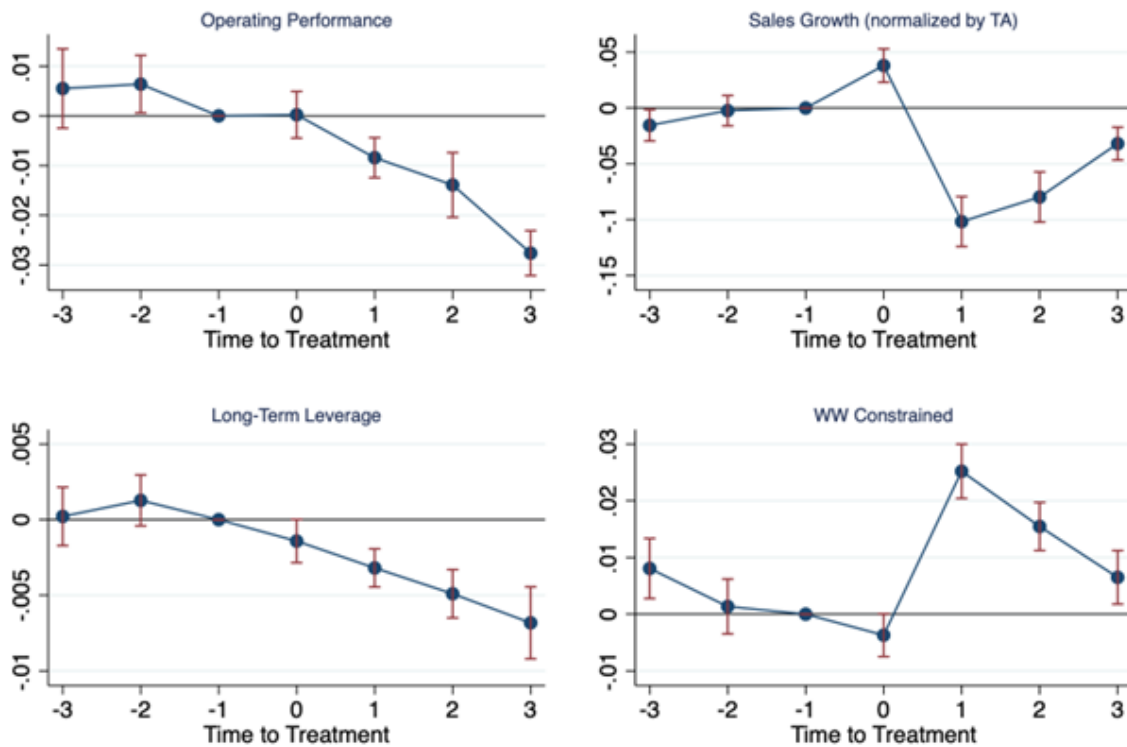
Table 1 – Sample Description

This table presents the percentage of mafia-type firms and other firms for both the full and matching samples by i) Nace Rev.2 section and ii) Macro-region and Legal form type. The reference period is 2000 to 2018. The matching sample has been employed for Eq.2.

	Full Sample				Matching Sample			
	Mafia-type firms		Other firms		Mafia-type firms		Other firms	
Nace Rev.2 section	# Firms	Per cent	# Firms	%	# Firms	Per cent	# Firms	%
Manufacturing	1,290	16.9	74,454	19.3	753	13.6	2,351	11.9
Construction	1,562	20.4	66,206	17.2	1,275	23.0	4,839	24.6
Wholesale and retail trade	2,360	30.9	96,200	25.0	1,853	33.5	6,050	30.7
Transportation and storage	440	5.8	15,780	4.1	297	5.4	1,073	5.4
Accommodation and food service activities	496	6.5	23,044	6.0	367	6.6	1,436	7.3
Information and communication	72	0.9	4,208	1.1	43	0.8	160	0.8
Real estate activities	532	7.0	58,756	15.2	407	7.3	1,745	8.9
Professional, scientific, technical and other act.	895	11.7	46,755	12.1	544	9.8	2,052	10.4
Total	7,647	100.0	385,403	100.0	5,539	100.0	19,706	100.0
Italian Macro-region								
North	1,810	23.7	222,507	57.7	1,083	19.6	4,982	25.3
Center	832	10.9	96,740	25.1	517	9.3	2,382	12.1
South	5,005	65.5	66,156	17.2	3,939	71.1	12,342	62.6
Total	7,647	100.0	385,403	100.0	5,539	100.0	19,706	100.0
Legal form								
Private limited companies	6,923	90.5	352,495	91.5	5,147	92.9	18,424	93.5
Public limited companies	362	4.7	12,597	3.3	144	2.6	342	1.7
Partnerships	254	3.3	15,480	4.0	194	3.5	742	3.8
Other legal forms	108	1.4	4,831	1.3	54	1.0	198	1.0
Total	7,647	100.0	385,403	100.0	5,539	100.0	19,706	100.0

Table 2 – Descriptive statistics

This table presents the summary statistics of all the main variables in this study. The sample spans the 2000-2018 window. All variables obtained as ratios based on Orbis or AIDA data are winsorized within the 1st and 99th percentiles. See Table A1 for variables' definitions. Normalized difference refers to the difference in mean values between the subsample of mafia-type firms and other firms. Normalized difference is obtained according to the definition in Imbens and Woolridge (2009).

Variable	Whole Sample						Mafia-type firms	Other firms	Normalized diff.
	#Obs.	Mean	St. Dev.	p25	Median	p75	Mean	Mean	
Firm characteristics									
Operating Performance	2,191,466	0.04	0.31	0.01	0.04	0.11	0.04	0.04	-0.01
Sales Growth	2,191,466	0.11	0.60	-0.09	0.00	0.17	0.10	0.11	-0.00
Long-Term Leverage	2,191,071	0.08	0.15	0.00	0.00	0.11	0.07	0.08	-0.05
WW -index	2,190,451	0.29	0.45	0.00	0.00	1.00	0.27	0.29	-0.04
Payables to COGS (*PtC*)	2,191,466	0.60	1.35	0.16	0.29	0.49	0.67	0.60	0.04
Size	2,191,466	1.89	0.24	1.74	1.90	2.05	1.90	1.89	0.05
Age	2,191,466	2.58	0.73	2.08	2.56	3.14	2.54	2.58	-0.04
Leverage	2,191,466	0.19	0.21	0.00	0.12	0.33	0.17	0.19	-0.08
Profitability	2,191,466	0.05	0.11	0.01	0.04	0.08	0.05	0.05	-0.01
Tangibility	2,191,466	0.24	0.28	0.03	0.11	0.36	0.20	0.24	-0.09
Cash	2,191,466	0.11	0.15	0.01	0.04	0.15	0.11	0.11	0.01
Receivables	2,191,466	0.38	0.53	0.08	0.26	0.45	0.41	0.38	0.04
Top executive characteristics									
Top Executive origin	2,191,466	0.17	0.37	0.00	0.00	0.00	0.96	0.15	1.98
Top Executive age	2,191,466	52.55	12.80	43.00	51.00	61.00	50.91	52.59	-0.09
Top Executive tenure	2,191,466	6.67	5.85	2.00	5.00	10.00	7.43	6.66	0.09
Top Executive female	2,191,466	0.19	0.39	0.00	0.00	0.00	0.18	0.19	-0.03
Board characteristics (avg.)									
Board of Directors age (avg)	2,191,466	52.39	12.42	44.00	51.33	61.00	50.88	52.42	-0.09
Board of Directors tenure (avg)	2,191,466	6.72	5.79	2.00	5.00	10.00	7.64	6.70	0.11
Board of Directors female (avg)	2,191,466	0.20	0.39	0.00	0.00	0.00	0.18	0.20	-0.04

Table 3 – Correlation Matrix

This table presents the correlation matrix of the main variables in this study. The sample spans the 2000-2018 window. All variables obtained as ratios based on Orbis or AIDA data are winsorized within the 1st and 99th percentiles. See Table A1 for variables' definitions.

	Operating Performance	Sales Growth	Long-Term Leverage	WW -index	Payables to COGS	Size	Age	Leverage	Profitability	Tangibility	Cash	Receivables
Operating Performance	1,0000											
Sales Growth	0,0598	1,0000										
Long-Term Leverage	0,0571	-0,0675	1,0000									
WW-index	-0,1086	-0,1179	-0,0952	1,0000								
Payables to COGS	-0,0208	-0,0698	0,0923	-0,0116	1,0000							
Size	0,0432	-0,0732	0,1758	-0,7228	0,0459	1,0000						
Age	0,0062	-0,2459	0,0155	-0,2643	-0,0038	0,4038	1,0000					
Leverage	0,0282	-0,0815	0,6487	-0,1323	0,0500	0,2103	0,0525	1,0000				
Profitability	0,2840	-0,0176	-0,0844	-0,0046	-0,0925	-0,0272	-0,0462	-0,1391	1,0000			
Tangibility	0,0934	-0,0695	0,2873	-0,1358	0,0979	0,1594	0,1829	0,1681	-0,0988	1,0000		
Cash	0,0477	0,0808	-0,2005	0,2035	-0,1035	-0,2842	-0,1186	-0,3383	0,2491	-0,2396	1,0000	
Receivables	-0,0776	0,0294	-0,0129	-0,0383	0,2432	0,0245	0,0506	0,0017	-0,0888	-0,0354	-0,1597	1,0000

Table 4 – Mafia-surname Peers

This table reports the regression results for the effect of the presence of at least one Mafia-surname firm in a municipality and industry NACE 4-digit on peer firms' economic outcome. Panel A, C and D control for Firm and Year F.E, while Panel B controls for region*Industry*Year F.E. Panel C excludes large peers' clusters, while Panel D excludes Mafia-origin regions. Standard errors are clustered at the municipality level and are reported in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Variables' definitions are provided in Table A1.

	(1) Operating Performance	(2) Sales Growth	(3) Long-Term Leverage	(4) WW-index
PANEL A – Baseline				
Mafia-surname Peers	-0.012***	-0.016***	-0.004***	0.004**
	[0.003]	[0.005]	[0.001]	[0.002]
Size	0.535***	0.834***	0.168***	-1.419***
	[0.008]	[0.019]	[0.005]	[0.015]
Age	-0.029***	-1.127***	-0.006***	0.141***
	[0.004]	[0.021]	[0.001]	[0.003]
Cash	0.028***	-0.000	-0.019***	0.033***
	[0.003]	[0.010]	[0.001]	[0.004]
Observations	2116005	2116005	2115605	2114896
r2	0.53	0.36	0.77	0.77
PANEL B – Controlling for Region*Industry*Year F.E.				
Mafia-surname Peers	-0.005***	-0.030***	-0.002**	0.006***
	[0.002]	[0.004]	[0.001]	[0.002]
Size	0.536***	0.870***	0.169***	-1.436***
	[0.008]	[0.018]	[0.005]	[0.016]
Age	-0.026***	-1.134***	-0.008***	0.145***
	[0.003]	[0.021]	[0.001]	[0.003]
Cash	0.021***	0.000	-0.018***	0.034***
	[0.003]	[0.010]	[0.001]	[0.004]
Observations	2107209	2107209	2106807	2106098
r2	0.54	0.38	0.77	0.78
PANEL C – Excluding large peers' clusters (municipality-industry-year with more than 300 obs.)				
Mafia-surname Peers	-0.004**	-0.031***	-0.002*	0.005**
	[0.002]	[0.004]	[0.001]	[0.002]
Size	0.528***	0.896***	0.164***	-1.445***
	[0.007]	[0.027]	[0.008]	[0.014]
Age	-0.030***	-1.157***	-0.007***	0.147***
	[0.002]	[0.023]	[0.001]	[0.003]
Cash	0.024***	0.001	-0.018***	0.034***
	[0.003]	[0.012]	[0.001]	[0.004]
Observations	1963074	1963074	1962699	1962212
r2	0.54	0.39	0.77	0.78
PANEL D – Excluding Mafia-origin regions				
Mafia-surname Peers	-0.014***	-0.011	-0.004***	0.005**
	[0.004]	[0.007]	[0.001]	[0.002]
Size	0.543***	0.845***	0.176***	-1.428***
	[0.008]	[0.022]	[0.007]	[0.017]
Age	-0.026***	-1.063***	-0.009***	0.134***
	[0.004]	[0.028]	[0.001]	[0.004]
Cash	0.026***	-0.006	-0.019***	0.031***
	[0.003]	[0.013]	[0.001]	[0.004]
Observations	1865286	1865286	1864914	1864211
r2	0.54	0.35	0.77	0.77

Table 5 – Placebo Test

This table plots the distribution of the coefficients on *Mafia-surname Peers* estimated from the placebo test by randomizing the assignment of treatment (with no replacement). We estimate the effect of pseudo-treatment with the full set of control variables as presented in the baseline model. We store the coefficient of *Mafia-surname Peers* and repeat this procedure 1,000 times to generate the distribution of the placebo estimates (mean, standard error, and relevant percentiles). p5_left refers to the 5th percentile of the left distribution, while p5_right refers to the 5th percentile of the right distribution.

	Coefficient b[*Mafia-surname Peers*] when the dependent variable is:			
	Operating Performance	Sales Growth	Long-Term Leverage	WW-index
Mean	-.0002	-.0031	-.0005	.0008
S.E.	[.0011]	[.0018]	[.0004]	[.0010]
p5_left	-.0020	-.0061	-.0013	-.0009
Median	-.0002	-.0031	-.0005	.0008
p5_right	.0015	-.0003	.0002	.0025
Controls	[see Tab. 4]	[see Tab. 4]	[see Tab. 4]	[see Tab. 4]

Table 6 – Mafia-surname firm and liquidity transfer

This table reports the estimation results of the baseline model. Column (1) considers the full sample; Column (2) considers the matching sample; Column (3) considers a three-years' window analysis; Column (4) assigns zeros to *Mafia-surname firm* if firm becomes Mafia-surname firms after the appointment of Top executives whose surname coincides with that of Mafiosi disclosed by DIA reports; Column (5) considers only firms with the same Top Executives over the sample period; and Column (6) uses the *PtC* deviation from average values by industry-region-year as an alternative dependent variable. Variables' definitions are provided in Table A1. Standard errors are clustered at the provincial level and are reported in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable: *PtC*	Full Sample	Matching Sample	[-3;+3] Window	Alternative treatment definition	Same Top Executives over the sample period	Deviations from average values by industry-region-year
	(1)	(2)	(3)	(4)	(5)	(6)
Mafia-surname firm	0.063***	0.040**	0.038**	0.068***	0.056**	0.050***
	[0.011]	[0.017]	[0.015]	[0.014]	[0.026]	[0.011]
TopExecutiveOrigin	-0.015	-0.043	-0.065	-0.002		-0.014
	[0.022]	[0.041]	[0.059]	[0.022]		[0.021]
Size	-0.150***	-0.244***	-0.102	-0.150***	-0.074	-0.121***
	[0.040]	[0.086]	[0.153]	[0.040]	[0.046]	[0.036]
Age	0.184***	0.160***	0.154***	0.184***	0.181***	0.162***
	[0.009]	[0.025]	[0.029]	[0.009]	[0.015]	[0.011]
Leverage	-0.117***	-0.190***	-0.145***	-0.117***	-0.155***	-0.110***
	[0.012]	[0.035]	[0.034]	[0.012]	[0.013]	[0.012]
Profitability	-0.255***	-0.236***	-0.219***	-0.255***	-0.221***	-0.239***
	[0.015]	[0.036]	[0.042]	[0.015]	[0.014]	[0.014]
Tangibility	0.222***	0.264***	0.142***	0.222***	0.235***	0.194***
	[0.017]	[0.050]	[0.048]	[0.017]	[0.023]	[0.016]
Cash	-0.006	-0.009	-0.044	-0.006	-0.005	-0.003
	[0.009]	[0.040]	[0.033]	[0.009]	[0.014]	[0.008]
Receivables	0.280***	0.400***	0.252***	0.280***	0.282***	0.259***
	[0.017]	[0.039]	[0.027]	[0.017]	[0.020]	[0.016]
Firm f.e.	YES	YES	YES	YES	YES	YES
Year f.e.	YES	YES	YES	YES	YES	YES
Observations	2,191,466	215,976	138,412	2,191,466	932,859	2,191,466
r2	0.65	0.63	0.70	0.65	0.64	0.63

Table 7 – Central-northern regions vs. Mafia-origins regions: full and matched samples

This table reports the estimation results of the baseline model by spitting the sample between firms located in central-northern regions and those in Mafia-origins regions. Variable definitions are provided in Table A1. Standard errors are clustered at the provincial level and are reported in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable: *PtC*	Full sample		Matched sample	
	Central-northern regions	Mafia-origins regions	Central-northern regions	Mafia-origins regions
	(1)	(2)	(3)	(4)
Mafia-surname firm	0.065***	0.014	0.086***	0.022
	[0.017]	[0.014]	[0.023]	[0.015]
TopExecutiveOrigin	-0.044***	0.202*	-0.147***	0.247**
	[0.012]	[0.103]	[0.040]	[0.110]
Size	-0.140***	-0.209*	-0.102	-0.301**
	[0.043]	[0.105]	[0.104]	[0.124]
Age	0.177***	0.192***	0.202***	0.127***
	[0.010]	[0.023]	[0.035]	[0.034]
Leverage	-0.108***	-0.213***	-0.139***	-0.225***
	[0.012]	[0.037]	[0.042]	[0.041]
Profitability	-0.241***	-0.360***	-0.169**	-0.289***
	[0.014]	[0.024]	[0.064]	[0.047]
Tangibility	0.208***	0.339***	0.221**	0.288***
	[0.017]	[0.049]	[0.087]	[0.060]
Cash	-0.004	-0.001	-0.032	0.003
	[0.009]	[0.041]	[0.044]	[0.056]
Receivables	0.264***	0.367***	0.283***	0.447***
	[0.017]	[0.030]	[0.045]	[0.040]
Firm f.e.	YES	YES	YES	YES
Year f.e.	YES	YES	YES	YES
Observations	1,910,180	281,286	70,528	145,448
r2	0.65	0.65	0.63	0.63

Table 8 – Mafia presence Index: full and matched samples. Only for central-northern regions.

This table reports the estimation results of the baseline model only for firms located in central-northern regions. Specifically, we split the sample according to whether firms are in provinces with a high Mafia Index (above the median), *High Mafia Index,* or in provinces with a low Mafia Index (below the median), *Low Mafia Index*. We adopt the Transcrime Mafia Index (TMI) as the baseline measure for mafia presence at the provincial level. For this analysis we consider both the full and matching samples. Variables' definitions are provided in Table A1. Standard errors are clustered at the provincial level and are reported in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Full Sample		Matched Sample	
	Low Mafia Index (1)	High Mafia Index (2)	Low Mafia Index (3)	High Mafia Index (4)
Mafia-surname firm	0.001	0.074***	-0.017	0.103***
	[0.073]	[0.016]	[0.092]	[0.020]
TopExecutiveOrigin	0.012	-0.055***	-0.052	-0.158***
	[0.044]	[0.011]	[0.163]	[0.042]
Size	-0.245***	-0.094**	-0.222	-0.087
	[0.043]	[0.045]	[0.284]	[0.107]
Age	0.164***	0.183***	0.263***	0.194***
	[0.012]	[0.012]	[0.083]	[0.035]
Leverage	-0.096***	-0.113***	-0.346**	-0.109**
	[0.023]	[0.014]	[0.149]	[0.043]
Profitability	-0.280***	-0.226***	-0.065	-0.181**
	[0.024]	[0.013]	[0.149]	[0.068]
Tangibility	0.211***	0.208***	0.313*	0.208**
	[0.030]	[0.021]	[0.182]	[0.097]
Cash	0.008	-0.008	-0.257**	-0.004
	[0.018]	[0.010]	[0.106]	[0.043]
Receivables	0.257***	0.266***	0.327***	0.277***
	[0.016]	[0.024]	[0.083]	[0.050]
Firm f.e.	YES	YES	YES	YES
Year f.e.	YES	YES	YES	YES
Observations	609,189	1,300,991	9,058	61,470
r2	0.64	0.65	0.64	0.63

Table 9. Industry characteristics

This table reports the estimation results of the baseline model for the full sample (Columns (1)-(3)) and matched sample (Columns (4)-(6)). Following Giannetti et al. (2011), we identify firms that rely on either *standardized goods* or *differentiated goods*. We consider a firm using a high (low) proportion of differentiated inputs if the share of inputs that comes from sectors producing differentiated inputs is above (below) the median value for the entire sample. We follow the same procedure for standardized inputs. Variables' definitions are provided in Table A1. Standard errors are clustered at the provincial level and are reported in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A Relevance of differentiated inputs

Dependent variable: *PtC*	Full Sample		Matched Sample	
	Low relevance of differentiated inputs (1)	High relevance of differentiated inputs (2)	Low relevance of differentiated inputs (3)	High relevance of differentiated inputs (4)
Mafia-surname firm	0.031	0.078***	0.023	0.059***
	[0.025]	[0.021]	[0.035]	[0.018]
TopExecutiveOrigin	0.056*	-0.020	0.104	-0.069
	[0.028]	[0.028]	[0.092]	[0.060]
Controls	YES	YES	YES	YES
Firm f.e.	YES	YES	YES	YES
Year f.e.	YES	YES	YES	YES
Observations	1220666	465093	98612	50414
r2	0.66	0.64	0.65	0.64

Panel B Relevance of standardized inputs

Dependent variable: *PtC*	Full Sample		Matched Sample	
	Low relevance of standardized inputs (1)	High relevance of standardized inputs (2)	Low relevance of standardized inputs (3)	High relevance of standardized inputs (4)
Mafia-surname firms	0.066***	0.016	0.044***	0.021
	[0.011]	[0.036]	[0.014]	[0.042]
TopExecutiveOrigin	0.006	0.067	0.023	0.072
	[0.031]	[0.047]	[0.067]	[0.137]
Controls	YES	YES	YES	YES
Firm f.e.	YES	YES	YES	YES
Year f.e.	YES	YES	YES	YES
Observations	944653	741106	83979	65047
r2	0.63	0.66	0.63	0.66

Table 10 – Controlling for omitted variables for top executives' and board of directors' characteristics

This table reports the estimation results of the baseline model for the full sample (Columns (1)-(3)) and matched sample (Columns (4)-(6)). Columns (1) and (4) consider top executives' characteristics such as age (Top-Executive Age), tenure (Top-Executive Tenure), and gender, (Top-Executive Female). Columns (2) and (5) consider the average values of Board of Directors' characteristics such as age (Board of Directors' age (avg)), tenure Board of Directors' tenure (avg), and percentage of female directors Board of Directors female (avg). Columns (3) and (6) consider top executive province of origin FE. Variables' definitions are provided in Table A1. Standard errors are clustered at the provincial level and are reported in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable: PtC	Full sample			Matched sample		
	(1)	(2)	(3)	(4)	(5)	(6)
Mafia-surname firm	0.063***	0.063***	0.063***	0.039**	0.039**	0.040**
	[0.011]	[0.011]	[0.011]	[0.017]	[0.017]	[0.017]
TopExecutiveOrigin	-0.023	-0.020		-0.048	-0.044	
	[0.023]	[0.022]		[0.045]	[0.044]	
Top Executive age	0.002***			0.002		
	[0.000]			[0.001]		
Board of Directors' age (avg)		0.002***			0.004*	
		[0.001]			[0.002]	
Top Executive tenure	-0.000			-0.002		
	[0.000]			[0.002]		
Board of Directors' tenure (avg)		0.000			-0.002	
		[0.001]			[0.003]	
Top Executive female	-0.002			0.030		
	[0.013]			[0.040]		
Board of Directors' female (avg)		-0.007			0.051	
		[0.017]			[0.067]	
Size	-0.151***	-0.150***	-0.150***	-0.244***	-0.244***	-0.244***
	[0.040]	[0.040]	[0.040]	[0.086]	[0.086]	[0.084]
Age	0.183***	0.183***	0.184***	0.161***	0.160***	0.159***
	[0.009]	[0.009]	[0.009]	[0.025]	[0.025]	[0.026]
Leverage	-0.117***	-0.117***	-0.117***	-0.190***	-0.190***	-0.191***
	[0.012]	[0.012]	[0.012]	[0.035]	[0.035]	[0.034]
Profitability	-0.255***	-0.255***	-0.255***	-0.236***	-0.236***	-0.236***
	[0.015]	[0.015]	[0.015]	[0.036]	[0.036]	[0.036]
Tangibility	0.222***	0.222***	0.222***	0.263***	0.263***	0.265***
	[0.017]	[0.017]	[0.017]	[0.050]	[0.050]	[0.050]
Cash	-0.006	-0.006	-0.006	-0.010	-0.010	-0.010
	[0.009]	[0.009]	[0.009]	[0.040]	[0.040]	[0.039]
Receivables	0.280***	0.280***	0.280***	0.400***	0.400***	0.399***
	[0.017]	[0.017]	[0.017]	[0.039]	[0.039]	[0.040]
Firm f.e.	YES	YES	YES	YES	YES	YES
Year f.e.	YES	YES	YES	YES	YES	YES
Top exec. province f.e.	NO	NO	YES	NO	NO	YES
Observations	2,191,466	2,191,466	2,191,466	215,976	215,976	215,976
r2	0.65	0.65	0.65	0.63	0.63	0.63

Table 11 - Social Capital

This table reports the estimation results of the baseline model for the full sample (Columns (1)-(2)) and matched sample (Columns (3)-(4)) focusing on Northern regions. Columns (1) and (3) in Panel A consider firms located in provinces with low Judicial inefficiency, while Columns (2) and (4) consider firms located in provinces with high Judicial inefficiency. We identify provinces with Low (High) Judicial Inefficiency if the average number of years to complete the first-degree trial for all the courts located in those provinces is below (above) the national median value. Columns (1) and (3) in Panel B consider firms located in provinces with low referenda participation (above the national median participation rate), while Columns (2) and (4) consider firms located in provinces with high referenda participation (below the national median participation rate). We identify provinces with Low (High) Judicial Inefficiency if the average number of years to complete the first-degree trial for all the courts located in those provinces is below (above) the national median value. Variables' definitions are provided in Table A1. Standard errors are clustered at the provincial level and are reported in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A Judicial Inefficiency

Dependent variable: *PtC*	Full Sample		Matched Sample	
	Low Judicial Inefficiency	High Judicial Inefficiency	Low Judicial Inefficiency	High Judicial Inefficiency
	(1)	(2)	(3)	(4)
Mafia-surname firm	0.065***	0.066**	0.092***	0.078**
	[0.024]	[0.030]	[0.028]	[0.036]
TopExecutiveOrigin	-0.042**	-0.048***	-0.163***	-0.120**
	[0.018]	[0.015]	[0.055]	[0.058]
Controls	YES	YES	YES	YES
Firm f.e.	YES	YES	YES	YES
Year f.e.	YES	YES	YES	YES
[t-test] Difference in Mafia-surname firm		0.001		-0.014
		[0.042]		[0.045]
Observations	1206032	704148	45741	24787
r2	0.65	0.65	0.63	0.63

Panel B Referenda participation

| Dependent variable: *PtC*	Full Sample		Matched Sample	
	Low Referenda Participation	High Referenda Participation	Low Referenda Participation	High Referenda Participation
	(1)	(2)	(3)	(4)
Mafia-surname firm	0.049**	0.099*	0.079***	0.102*
	[0.020]	[0.050]	[0.025]	[0.057]
TopExecutiveOrigin	-0.060***	-0.006	-0.150***	-0.134*
	[0.010]	[0.031]	[0.050]	[0.072]
Controls	YES	YES	YES	YES
Firm f.e.	YES	YES	YES	YES
Year f.e.	YES	YES	YES	YES
[t-test] Difference in Mafia-surname firm		0.050		0.023
		[0.046]		[0.052]
Observations	1046121	864059	51723	18805
r2	0.65	0.65	0.63	0.64

Table 12 – Excluding typical regional surnames

This table reports the estimation results of the baseline model for the full sample (Columns (1)-(2)) and matched sample (Columns (3)-(4)). Columns (1) and (3) exclude the surnames that are typical in mafia-origins regions, while Columns (2) and (4) exclude the surnames that are typical both in mafia-origins regions and central-northern regions. We consider as typical surnames those belonging to the last quintile of the distribution of all the surnames in our sample. Variables' definitions are provided in Table A1. Standard errors are clustered at the provincial level and are reported in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable: *PtC*	Full Sample		Matched Sample	
	Excluding surnames typical of mafia-origins regions	Excluding surnames typical of mafia-origins regions and surnames typical of central-northern regions	Excluding surnames typical of mafia-origins regions	Excluding surnames typical of mafia-origins regions and surnames typical of central-northern regions
	(1)	(2)	(3)	(4)
Mafia-surname firm	0.068***	0.070***	0.057***	0.051**
	[0.015]	[0.016]	[0.021]	[0.021]
TopExecutiveOrigin	-0.031	-0.015	-0.044	0.023
	[0.033]	[0.046]	[0.052]	[0.074]
Size	-0.143***	-0.128***	-0.114	-0.144
	[0.042]	[0.046]	[0.099]	[0.117]
Age	0.179***	0.178***	0.141***	0.143***
	[0.009]	[0.011]	[0.029]	[0.029]
Leverage	-0.113***	-0.117***	-0.181***	-0.195***
	[0.012]	[0.013]	[0.036]	[0.043]
Profitability	-0.252***	-0.268***	-0.244***	-0.263***
	[0.015]	[0.016]	[0.041]	[0.046]
Tangibility	0.217***	0.213***	0.236***	0.236***
	[0.018]	[0.021]	[0.054]	[0.051]
Cash	-0.003	-0.001	-0.010	-0.012
	[0.010]	[0.012]	[0.050]	[0.058]
Receivables	0.273***	0.285***	0.365***	0.381***
	[0.017]	[0.016]	[0.033]	[0.029]
Firm f.e.	YES	YES	YES	YES
Year f.e.	YES	YES	YES	YES
Observations	1,982,810	1,1598,60	150,832	124,015
r2	0.65	0.65	0.64	0.64

Appendix A

Figure A.1: An example of a DIA report

Source: DIA semi-annual report, 2013. Note: This figure reports the list of mafia surnames in capital and bold letters for the province of Caserta.

Figure A.2: An example of the text in the DIA report

Il clan "CAPRIATI", unitamente all'emergente frangia criminale costituita dal gruppo "RIZZO - LORUSSO", seguiterebbe a contrastare l'espansionismo della consorteria "STRISCIUGLIO - DE FELICE-CALDAROLA", per il controllo delle attività illecite in alcuni quartieri del capoluogo.

Nel quartiere San Paolo i gruppi rivali "TELEGRAFO - MONTANI" e "DIOMEDE - MERCANTE", artefici già dal 2002 di una lunga disputa armata, hanno ripreso a fronteggiarsi con l'intento di assumere il controllo delle attività illecite nel quartiere.

Source: DIA semi-annual report, 2013. Note: The mafia surnames are directly reported in capital letters for the reports published before 2012.

Table A.1 – List of variables

Variable	Description	Source
Firm characteristics		
Mafia-surname Peer	It is a binary dummy equal to one if at least one other peer firm in the same year is identified as a Mafia-surname firm (see the corresponding definition). Peer firms are those operating in the same industry (4 digits) and municipality (*Comune*).	Our computation on Anti-Mafia Investigative Directive (DIA) reports and AIDA-BvD data
PtC - Payables to Cost of Goods	Creditors to Cost of Goods Sold ratio. Creditors is the volume of accounts payable, e.g., debt to suppliers	Our computation on AIDA-BvD data
Size	Total Assets in logarithms	Our computation on AIDA-BvD data
Age	Firm's age based on its year of incorporation	Our computation on AIDA-BvD data
Long-Term Leverage	Long-term Debt divided by Total Assets. In the BvD dataset, Long-term Debt is defined as long-term financial debts (e.g., to credit institutions (loans and credits), bonds)	Our computation on AIDA-BvD data
Short-term Leverage	Loans divided by Total Assets. In the BvD dataset, Loans are defined as short-term financial debts (e.g., to credit institutions + part of long-term financial debts payable within the year)	Our computation on AIDA-BvD data
Leverage	Sum of Loans and Long-term Debt divided by Total Assets. In the BvD dataset, Long-term Debt is defined as long-term financial debts (e.g., to credit institutions (loans and credits), bonds)	Our computation on AIDA-BvD data
Operating Performance	Operating Profit over Operating Revenues (Sales)	Our computation on AIDA-BvD data
Profitability	Operating Profit over Total Assets	Our computation on AIDA-BvD data
Sales Growth	Annual change in Operating Revenues (Sales) divided by the lagged level of Total Assets	Our computation on AIDA-BvD data
Tangibility	Tangible Fixed Assets over Total Assets	Our computation on AIDA-BvD data

Cash	Cash and Cash Equivalent over Total Assets	Our computation on AIDA-BvD data
Receivables	Debtors to Sales ratio. Debtors is the volume of accounts receivable, e.g., trade receivables from clients and customers	Our computation on AIDA-BvD data
WW-index	We identify financially constrained firms as firms whose WW index is above the median of the WW Index, and construct a binary variable accordingly. WW Index is built mirroring the approach proposed by Whited and Wu (2006) as: $-0.091 \times cashflow/total\_assets - 0.044 \times ln(total\_assets) + 0.102 \times sales\_growth\_avg -0.035 \times sales\_growth$, where $sales\_growth\_avg$ is the average value of Sales Growth in the same industry (3 digits) and year.	Our computation on AIDA-BvD data
Number of Employees to Total Assets	Number of Employees divided by Total Assets	Our computation on AIDA-BvD data
Cost of Employment to Total Assets	Cost of Employees divided by Total Assets	Our computation on AIDA-BvD data
Top Executives' characteristics		
Mafia-surname firm	It is a binary dummy equal to one if the firm's Top Executive i) has the same surname of that of Mafiosi disclosed by DIA reports; and ii) was born in one of the regions of the mafia-origins regions (Sicily, Apulia, Campania, Basilicata, or Calabria); and zero otherwise.	Our computation on Anti-Mafia Investigative Directive (DIA) reports and AIDA-BvD data
Top Executive Origin	It is a binary dummy equal to one if the firm's Top Executive is born in one of the mafia-origins regions (Sicily, Apulia, Campania, Basilicata, or Calabria).	Our computation on Anti-Mafia Investigative Directive (DIA) reports and AIDA-BvD data
Top Executive age	Age of the Top Executive based on information about her/his date of birth.	Our computation on AIDA-BvD data
Top Executive tenure	Tenure of the Top Executive is calculated by the number of years she/he spent in office in that firm based on information about her/his appointment date.	Our computation on AIDA-BvD data

Top Executive female	It is a binary dummy equal to one if the firm's Top Executive is a female.	Our computation on AIDA-BvD data
Typically surnames in mafia-origins regions	Accounts receivable to sales ratio	Our computation on AIDA-BvD data
Typically surnames in mafia-origins regions and central-northern regions	Accounts receivable to sales ratio	Our computation on AIDA-BvD data
Board of Directors' characteristics		
Board of Directors age (avg)	Average age of the members of the Board of Directors based on information about their date of birth.	Our computation on AIDA-BvD data
Board of Directors tenure (avg)	Average tenure of the members of the Board of Directors, calculated by the number of years they have spent in office in that firm based on information about their appointment date.	Our computation on AIDA-BvD data
Board of Directors female (avg)	Percentage of females in the Board of Directors.	Our computation on AIDA-BvD data
Regional Characteristics		
Low/High Mafia Index	Italian provinces are classified as "Low Mafia Index" if the value of the Index is below the median, and "Low Mafia Index" if the value is above the median. The Transcrime Mafia Index (TMI) is a measure of the mafia presence at the provincial level.	Our computation on Transcrime Mafia Index (TMI)
Mafia-origins regions	Sicily, Apulia, Campania, Basilicata, and Calabria.	Based on Anti-Mafia Investigative Directive (DIA) reports
Central-northern regions	All Italia regions excluding the Mafia-origins regions (see above).	Based on Anti-Mafia Investigative Directive (DIA) reports

Table A.2 – Mafia-surname Peers – Excluding clusters where the presence of mafia-type firms is due to mafia-type firms associated to top executives from Calabria ('ndrangheta clans' surnames)

This table reports the regression results for the effect of the presence of at least one Mafia-surname firm in a municipality and industry NACE 4-digit on peer firms' economic outcome. All the panels exclude clusters where at least one mafia-type firm is associated to top executives from Calabria ('ndrangheta clans' surnames). Panel A controls for Firm and Year F.E, while Panel B controls for region*Industry*Year F.E. Standard errors are clustered at the municipality level and are reported in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Variables' definitions are provided in Table A1.

	(1) Operating Performance	(2) Sales Growth	(3) Long-Term Leverage	(4) WW-index
PANEL A – Baseline				
Mafia-surname Peers	-0.012***	-0.015***	-0.004***	0.004**
	[0.003]	[0.004]	[0.001]	[0.002]
Size	0.535***	0.835***	0.168***	-1.419***
	[0.008]	[0.018]	[0.005]	[0.015]
Age	-0.029***	-1.123***	-0.006***	0.141***
	[0.004]	[0.020]	[0.001]	[0.003]
Cash	0.028***	-0.002	-0.019***	0.033***
	[0.003]	[0.010]	[0.001]	[0.004]
Observations	2090495	2090495	2090100	2089404
r2	0.53	0.36	0.77	0.77
PANEL B – Controlling for Region*Industry*Year F.E.				
Mafia-surname Peers	-0.005**	-0.031***	-0.002*	0.007***
	[0.002]	[0.004]	[0.001]	[0.002]
Size	0.535***	0.871***	0.169***	-1.435***
	[0.008]	[0.017]	[0.005]	[0.015]
Age	-0.026***	-1.131***	-0.008***	0.145***
	[0.002]	[0.021]	[0.001]	[0.003]
Cash	0.022***	-0.001	-0.019***	0.034***
	[0.003]	[0.010]	[0.001]	[0.004]
Observations	2081692	2081692	2081295	2080599
r2	0.54	0.38	0.77	0.78

Table A.3 – Dynamic treatment analysis

This table reports the dynamic treatment analysis of the results in Table 6 for the full sample. The dependent variable is *PtC*. *Mafia-surname firm $^{-3+}$* and *Mafia-surname firm $^{-2}$* are dummy variables equal to one for, respectively, three and more years and two years before the top executive' surname appears in the DIA report, and 0 otherwise; *Mafia-surname firms ^{0}* is a dummy variable equal to one in the year in which the top executive' surname appears in the DIA report; *Mafia-surname firms $^{+1}$*, *Mafia-surname firms $^{2+}$* and *Mafia-surname firms $^{+3+}$* are dummy variables that equal to one for one year, two years and three years and more after the top executive' surname appears in the DIA report, respectively. Variables' definitions are provided in Table A1. Standard errors are clustered at the provincial level and are reported in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable: *PtC*	Italy	Central-northern regions	Mafia-origin regions
	(1)	(2)	(3)
Mafia-surname firm $^{-3+}$	-0.040**	-0.050	-0.033
	[0.020]	[0.031]	[0.025]
Mafia-surname firm $^{-2}$	-0.024	-0.023	-0.024
	[0.017]	[0.025]	[0.023]
Mafia-surname firm ^{0}	0.006	0.045	-0.005
	[0.015]	[0.028]	[0.016]
Mafia-surname firm $^{+1}$	0.022	0.081***	0.000
	[0.027]	[0.026]	[0.031]
Mafia-surname firm $^{+2}$	0.042*	0.112***	0.015
	[0.024]	[0.034]	[0.024]
Mafia-surname firm $^{+3+}$	0.013	0.105**	-0.025
	[0.031]	[0.040]	[0.031]
Top Executive Origin	-0.063	-0.166***	0.292**
	[0.059]	[0.061]	[0.116]
Firm-Year controls	YES	YES	YES
Firm f.e.	YES	YES	YES
EventYear dummies	YES	YES	YES
Year f.e.	YES	YES	YES
Observations	138,412	44,336	94,076
r2	0.70	0.71	0.69

Table A.4 – Placebo Test

This table plots the distribution of the coefficients on *Mafia-surname firm* estimated from the placebo test by randomizing the assignment of treatment (with no replacement) from the sample period between 2000 and 2018 for the matching sample. We estimate the effect of pseudo-treatment with the full set of control variables as presented in the baseline model. We store the coefficient of *Mafia-surname firm* and repeat this procedure 1,000 times to generate the distribution of the placebo estimates (mean, standard error, and relevant percentiles). p10_left refers to the 10th percentile of the left distribution, while p10_right refers to the 10th percentile of the right distribution. Standard errors are clustered at the provincial level and are reported in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable: *PtC*	
	_b[*Mafia-surname firm*]
Mean	-.0048
S.E.	[.0077]
p10_left	-.0174
Median	-.0044
p10_right	.0074
Controls	[see Tab. 4]

Table A.5 – Probability of a firm being treated

This table shows whether firms' characteristics drive the probability of a firm being treated. For this analysis we employ a logit model, where the dependent variable takes a value of one for the firms being treated, and zero otherwise. Once a firm became treated, that firm is then dropped from the sample. We consider as a firm's characteristics the regressors reported in Equation 1 plus *PtC*, the main variable of interest. Standard errors are clustered at the provincial level and are reported in brackets. $***$, $**$, and $*$ denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable: Mafia-surname firm	(1)	(2)
Payables-to-COGS	-0.003	-0.001
	[0.010]	[0.010]
Size		0.463***
		[0.068]
Age		-0.001
		[0.019]
Leverage		0.162**
		[0.072]
Profitability		0.212*
		[0.128]
Tangibility		-0.299***
		[0.062]
Cash		-0.170*
		[0.098]
Constant	-4.026***	-4.870***
	[0.159]	[0.203]
Province f.e.	YES	YES
Industry (2-digit) f.e.	YES	YES
Year f.e.	YES	YES
Observations	2,154,076	2,154,076
Pseudo r2	0.17	0.17

Table A.6 – Excluding firm with top executives born in Calabria or in construction industry

This table reports the estimation results of Table 6 for the full sample (Columns (1)-(2)) and matched sample (Columns (3)-(4)). Columns (1) and (3) exclude firm with top executives born in Calabria, while Columns (2) and (4) exclude firm in the construction sector. Variables' definitions are provided in Table A1. Standard errors are clustered at the provincial level and are reported in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable: *PtC*	Full Sample		Matched Sample	
	Excluding firm with top executives born in Calabria	Excluding firms in the construction industry	Excluding firm with top executives born in Calabria	Excluding firms in the construction industry
	(1)	(2)	(3)	(4)
Mafia-surname firm	0.068***	0.044***	0.070***	0.036*
	[0.015]	[0.012]	[0.016]	[0.019]
TopExecutiveOrigin	-0.031	0.027	-0.015	0.030
	[0.033]	[0.018]	[0.046]	[0.049]
Size	-0.143***	0.029	-0.128***	0.044
	[0.042]	[0.037]	[0.046]	[0.079]
Age	0.179***	0.127***	0.178***	0.079***
	[0.009]	[0.010]	[0.011]	[0.025]
Leverage	-0.113***	-0.108***	-0.117***	-0.177***
	[0.012]	[0.012]	[0.013]	[0.032]
Profitability	-0.252***	-0.237***	-0.268***	-0.252***
	[0.015]	[0.015]	[0.016]	[0.039]
Tangibility	0.217***	0.229***	0.213***	0.262***
	[0.018]	[0.019]	[0.021]	[0.044]
Cash	-0.003	0.020**	-0.001	0.033
	[0.010]	[0.009]	[0.012]	[0.032]
Receivables	0.273***	0.283***	0.285***	0.430***
	[0.017]	[0.018]	[0.016]	[0.046]
Firm f.e.	YES	YES	YES	YES
Year f.e.	YES	YES	YES	YES
Observations	2,151,783	1,829,222	203,794	164,146
r2	0.65	0.65	0.63	0.64

Table A.7 – Highly-cited Mafia Surnames

This table reports the estimation results of the baseline model for the full sample (Columns (1)-(3)) and matched sample (Columns (2)-(4)) focusing on Central-northern regions. Columns (1) and (2) consider mafia surnames that are cited in more than three DIA reports, while Columns (3) and (5) consider mafia surnames than are cited in three or fewer DIA reports. Variables' definitions are provided in Table A1. Standard errors are clustered at the provincial level and are reported in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable: *PtC*	Considering only highly-cited mafia surnames		Considering only lowly-cited mafia surnames	
	Full Sample	Matching Sample	Full Sample	Matching Sample
	(1)	(2)	(3)	(4)
Mafia-surname firm	0.086***	0.108***	0.039	0.075*
	[0.031]	[0.036]	[0.035]	[0.038]
TopExecutiveOrigin	-0.025*	-0.119*	-0.042*	-0.279***
	[0.014]	[0.063]	[0.024]	[0.078]
Size	-0.130***	-0.126	-0.143***	-0.007
	[0.047]	[0.099]	[0.046]	[0.135]

x

Age	0.180***	0.224***	0.176***	0.205***
	[0.009]	[0.034]	[0.010]	[0.042]
Leverage	-0.101***	-0.132**	-0.111***	-0.163***
	[0.012]	[0.061]	[0.013]	[0.046]
Profitability	-0.242***	-0.173***	-0.236***	-0.157**
	[0.014]	[0.060]	[0.014]	[0.062]
Tangibility	0.208***	0.188**	0.215***	0.264***
	[0.018]	[0.092]	[0.018]	[0.093]
Cash	-0.006	-0.061	-0.003	-0.017
	[0.010]	[0.045]	[0.009]	[0.040]
Receivables	0.263***	0.274***	0.261***	0.274***
	[0.017]	[0.052]	[0.018]	[0.034]
Firm f.e.	YES	YES	YES	YES
Year f.e.	YES	YES	YES	YES
Observations	1758695	59201	1767285	61851
r2	0.65	0.63	0.65	0.64

APPENDIX B

A short historical overview of Mafia clans in Italy

The Sicilian Mafia (*Cosa Nostra*) made its first appearance in the nineteenth century in Sicily during the tumultuous process of the fall of the Bourbon Kingdom (which had included southern Italy and Sicily) and the unification of Italy (e.g., Gambetta, 1993; Lupo, 1996; Dickie, 2004;).[32] Besides the highly profitable business around illicit drug production and trafficking, the mafia has traditionally focused on private protection and racketeering, and on private and public construction. Similarly, *'ndrangheta* originated in the nineteenth century in the province of Reggio Calabria with brigandage movements on the Aspromonte uplands, to oppose Italy's unification, which was heralding the dismantling of the feudal system and introducing modern capitalism to the rural areas

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[32] In the 1890s the mafia was present in most of the urban parts of Sicily, in some of the mining areas, such as Favara and Grotte in the Girgenti province, and in the most rural parts of the island (Buonanno et al., 2015). The spread of the mafia over the Sicilian territory was possible due to a pervasive use of coercive power by landowners and local politicians against the Peasant Fasci movement (Acemoglou et al., 2020), a popular movement of democratic and socialist inspiration in support of the poorest and most exploited working classes' rights. Although the mafia declined considerably during Mussolini's fascist dictatorship, however, after the war, former members of the mafia formed tight relations with the Christian Democrats, which became the major party in Italy (e.g., De Feo and De Luca, 2017). Only with the Maxi trials of 1986–87, and the murder of two judges, Giovanni Falcone and Paolo Borsellino, did the mafia appear to have started declining.

of the South (Mirenda et al., 2022). Today *'ndrangheta* has a dominant position in most of the transnational drug traffic and most of the organization's revenues are produced outside Calabria (Mirenda et al., 2022). The origin of *Neapolitan Camorra* is still debated. *Neapolitan Camorra* comprises many bands without a horizontal and community-based structure as in the case of *'ndrangheta*.[33] It mainly specializes in cigarette smuggling, drug trafficking, extortion and usury, and counterfeiting. Originally founded by the Camorra boss Raffaele Cutolo, Apulian Sacra Corona Unita is the youngest Italian criminal organization, which became active between the late 1970s and early 1980s. The presence of close relationships with members of both the Calabrian *'ndrangheta* and *Neapolitan Camorra* has been crucial for the emergence of this new criminal organization (Massari, 2014). Apulian Sacra Corona Unita specializes in cigarette smuggling, arms trafficking, human trafficking, money laundering, extortion, and drug trafficking.[34] Finally, the so-called Basilischi was an Italian criminal organization, founded in 1994 in Potenza, and then extended to the rest of Basilicata. Since the late 1990s, this organization shrank significantly due to several arrests and interventions by the police. Nowadays, many areas are under the control of *'ndrangheta* clans.

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[33] During this post-Second World War period, Naples played a strategic role in the contraband market of cigarettes and, at the beginning of the 1970s, was a major base of international contraband and criminal traffic (Barbagallo, 1999; 2010). With the New Organized Camorra (Nuova Camorra Organizzata, NCO) established by the Boss Raffeale Cutolo in the 1980s and 1990s, Camorra changed its configuration from a criminal organization with a metropolitan ganger style into a more structured organization. During the same years, Camorra expanded its networks beyond the regional borders by acquiring a dominant position in the drug trafficking activities from Latin America.

[34] DIA, 2008. Semi-annual publication.