

# Mafia Infiltration and Ownership Dynamics in Italian Companies Amidst Covid-19

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- Organized crime groups (OCGs) invest vast amount of money into the legal economy for a variety of reasons, including:
  - maximise profit
  - facilitate and conceal ongoing illicit activities
  - launder illicit proceeds
  - perpetrate fraud
  - exert control over territories or sectors
  - strategically influence local politics and public administration
- Over 70% of OCGs' global criminal proceeds are laundered into the legal economy (about 2.7% of global GDP in 2009; UNODC, 2011)
- In the EU, OCGs' revenues of the 9 main criminal markets amount to 1% of GDP (139 billion euros in 2019; EC 2021)

- 86% of the most threatening criminal networks in the EU make use of legal business structures (LBSs; Europol, 2024)
- A large part does this by:
  - setting up their own LBSs; or
  - infiltrating existing LBSs at a high level
- In Italy, OCGs have been increasingly focusing on infiltration of the business system (DIA, 2020)
- Times of distress, like the pandemic, create additional opportunities for criminal organizations to infiltrate the legal economy

## Research question and contribution

- We study mafia infiltration into legal business in Italy during Covid-19 (March 2020 - July 2021)
- We shed light on how mafia infiltrates the economy through firm ownership during crises

## What we do

- Quantify the impact of social restrictions (business closures) on corporate ownership changes
- Assess whether it varies based on the strength of mafia presence in provinces
- Identify which kind of corporate changes are linked with infiltration and which sectors are more prone to it

## What we find

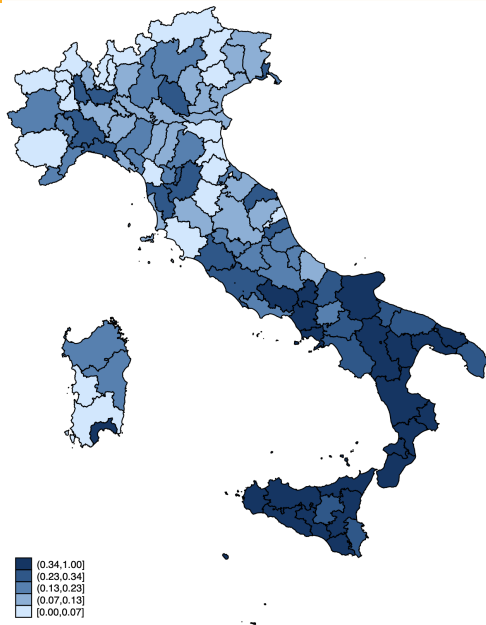
Elasticity of ownership changes to severity of closures depends on ex-ante mafia presence:

- Positive and larger where mafia is stronger → infiltration into firms
- Especially driven by replacement of existing shareholders with new ones
- Concentrated in sectors historically more prone to mafia infiltration (or racketeering) or attractive during Covid-19 (more profitable or more distressed)

- Data on ownership structure for partnerships (*società di persone*) and corporations (*società di capitali*) at daily frequency
- Four (mutually exclusive) types of change:
  1. entry of new shareholders, with no exit (*entry*)
  2. exit of incumbent shareholders, with no entry (*exit*)
  3. entry of new shareholders who entirely or partially replace exiting shareholders (*replacement*)
  4. changes in ownership percentage among existing shareholders (*reshuffle*)
- We compute the number of firms experiencing changes in each cell defined by the tuple (province, 2-digit Ateco (NACE) sector, month)

- Four periods of social restrictions:
  1. **Essential/non essential sectors:** March 12, 2020 - May 17, 2020
  2. **Re-openings:** May 18, 2020 - November 5, 2020
  3. **Color-coded regional risk:** November 6, 2020 - April 25, 2021
  4. **Green pass:** April 26, 2021 - March 31, 2022
- We hand-collect:
  - National decrees and lists of suspended/active Ateco codes (5-digit level) for each period
  - Data on the color-code assigned to the regions during the color-coded regional risk period + list of suspended Ateco codes for each color
- Weighted average of closures at region-month (2 digit sector), using 2019 sectors' shares of employment
- Final data coverage: March 2020-July 2021

- We use Istat crime data to construct an index based on Calderoni (2011):
  1. updated to 2010-2019 crimes
  2. extended to include “sentinel crimes”
- The mafia index (MI rate) is normalized so that it varies in the  $(0,1]$  interval



- Do Covid-19 closures have an impact on firms' ownership changes depending on the strength of local mafia presence?
- Our identification strategy relies on:
  1. Timely recording of ownership changes in firm registry data
  2. Exogeneity of restriction measures
    - Essential/not essential sector classification and severity of local contagion not anticipated by firms
    - Potential systematic differences across sectors in ownership changes can be controlled for (sector fixed effects)
    - Extent of restriction measures not correlated with ex-ante mafia presence (e.g. through unobserved characteristics that cannot be controlled for) ▶ Correlation mafia and Covid-19
  3. Mafia presence in a province captures the propensity of organized crime to keep operating in that area (leap of faith)

▶ Summary statistics



$$y_{p,t} = \beta_1 covid_{r,t} + \beta_2 covid_{r,t} \cdot mafia_p + \gamma_p + \delta_t + \epsilon_{p,t}$$

Account for both direct effect on affected sectors and sectoral spillovers on non-affected ones

## Empirical analysis: province-month level – main

$$y_{p,t} = \beta_1 \text{covid}_{r,t} + \beta_2 \text{covid}_{r,t} \cdot \text{mafia}_p + \gamma_p + \delta_t + \epsilon_{p,t}$$

	(1)	(2)	(3)	(4)
	Entry	Exit	Replacement	Reshuffle
Log(1+Closed days)	-0.078 (0.058)	-0.048 (0.040)	-0.178*** (0.039)	0.033** (0.014)
Log(1+Closed days) X Mafia	0.149** (0.063)	0.135** (0.056)	0.259*** (0.052)	-0.010 (0.012)
Observations	1785	1785	1785	1785
Adjusted $R^2$	0.856	0.908	0.923	0.986
Province FE	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes

Notes: Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

$$y_{p,t} = \beta_2 covid_{r,t} \cdot mafia_p + \gamma_p + \eta_{r,t} + \epsilon_{p,t}$$

Account for both direct effect on affected sectors and sectoral spillovers on non-affected ones + control for regional economic shocks (e.g. intensity of the pandemic)

## Empirical analysis: province-month level – more granular FE

$$y_{p,t} = \beta_2 covid_{r,t} \cdot mafia_p + \gamma_p + \eta_{r,t} + \epsilon_{p,t}$$

	(1)	(2)	(3)	(4)
	Entry	Exit	Replacement	Reshuffle
Log(1+Closed days) X Mafia	0.074 (0.114)	0.106 (0.092)	0.240*** (0.089)	0.020 (0.023)
Observations	1785	1785	1785	1785
Adjusted $R^2$	0.858	0.914	0.930	0.987
Province FE	Yes	Yes	Yes	Yes
Region-Year-Month FE	Yes	Yes	Yes	Yes

Notes: Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

$$y_{p,t} = \beta_2 covid_{r,t} \cdot mafia_p + \gamma_p + \eta_{r,t} + \epsilon_{p,t}$$

	(1)	(2)
	Closed companies	New companies
Log(1+Closed days) X Mafia	0.011 (0.102)	0.027 (0.051)
Observations	1779	1785
Adjusted $R^2$	0.856	0.957
Province FE	Yes	Yes
Region-Year-Month FE	Yes	Yes

Notes: Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

$$y_{s,p,t} = \beta_1 covid_{s,r,t} + \beta_2 covid_{s,r,t} \cdot mafia_p + \gamma_{p,t} + \delta_{s,t} + \epsilon_{s,p,t}$$

Directly link the intensity of the economic Covid-19 shock (closures) with ownership changes

Essential sectors are *de facto* excluded (closed days always zero)

## Empirical analysis: sector-province-month level – main

$$y_{s,p,t} = \beta_1 covid_{s,r,t} + \beta_2 covid_{s,r,t} \cdot mafia_p + \gamma_{p,t} + \delta_{s,t} + \epsilon_{s,p,t}$$

	(1)	(2)	(3)	(4)
	Entry	Exit	Replacement	Reshuffle
Log (1+Closed days)	0.014 (0.013)	0.013 (0.016)	-0.013 (0.016)	0.013 (0.015)
Log (1+Closed days) X Mafia	0.025*** (0.005)	0.039*** (0.006)	0.056*** (0.007)	-0.011 (0.008)
Observations	118199	118199	118199	118199
Adjusted R <sup>2</sup>	0.345	0.485	0.526	0.674
Province-Year-Month FE	Yes	Yes	Yes	Yes
Sector-Year-Month FE	Yes	Yes	Yes	Yes

Notes: Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

$$y_{s,p,t} = \beta_2 covid_{s,r,t} \cdot mafia_p + \gamma_{p,t} + \eta_{s,r,t} + \epsilon_{s,p,t}$$

Directly link the intensity of the economic Covid-19 shock (closures) with ownership changes + control for region-sector economic shocks (e.g. intensity of the pandemic and local public intervention) and dynamism



$$y_{s,p,t} = \beta_2 covid_{s,r,t} \cdot mafia_p + \gamma_{p,t} + \eta_{s,r,t} + \epsilon_{s,p,t}$$

	(1)	(2)	(3)	(4)
	Entry	Exit	Replacement	Reshuffle
Log (1+Closed days) X Mafia	0.012 (0.009)	0.036*** (0.011)	0.054*** (0.013)	0.018 (0.014)
Observations	118199	118199	118199	118199
Adjusted $R^2$	0.342	0.502	0.548	0.713
Province-Year-Month FE	Yes	Yes	Yes	Yes
Region-Sector-Year-Month FE	Yes	Yes	Yes	Yes

Notes: Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

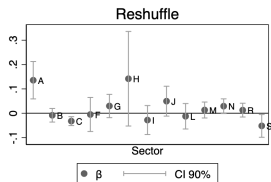
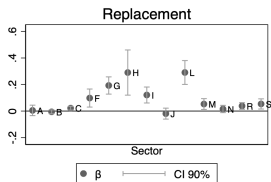
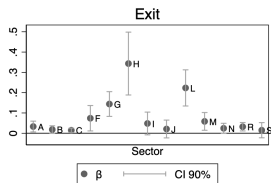
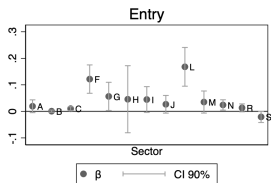
$$y_{s,p,t} = \beta_2 covid_{s,r,t} \cdot mafia_p + \gamma_{p,t} + \eta_{s,r,t} + \epsilon_{s,p,t}$$

Expect that infiltration is higher in sectors:

1. Historically more prone to mafia infiltration/racketeering and in financial distress
2. Benefited from the emergency (and became attractive)

# Empirical analysis: sector-province-month level – by sector

$$y_{s,p,t} = \beta_2 covid_{s,r,t} \cdot mafia_p + \gamma_{p,t} + \eta_{s,r,t} + \epsilon_{s,p,t}$$



- A agriculture, forestry and fishing
- B mining and quarrying
- C manufacturing
- F construction
- G wholesale and retail trade; repair of motor vehicles and motorcycles
- H transportation and storage
- I accommodation and food service activities
- J information and communication
- L real estate activities
- M professional, scientific and technical activities
- N administrative and support service activities
- R arts, entertainment and recreation
- S other service activities

Mario Draghi (Prime Minister, in May 2022):

*"Organized crime assumed new but equally fearful forms. It has spread into the boards of companies, both in the North and in the South of the country [...] It pollutes the economy, ranging from the real estate to the wholesale sector."*

- Results are consistent with recent findings:
  - Despite a generalized decline in ownership changes in April-September 2020 in Italy, the prevalence of anomalies among new owners was higher (Bosisio et al., Transcrime, 2021)
  - “[In the EU] Predominant sectors of known investments by OCGs are property and real estate, hospitality, environment, construction, transportation, wholesale and retail, and finance” (EC DG Migration and Home Affairs, 2021)
  - “[In the EU] Three sectors are particularly affected by criminal infiltration or abuse: construction, hospitality and logistics” (Europol, 2024)

- Response of changes in corporate structure to mandated closures during Covid-19 depends on the ex-ante mafia presence in the province where firms operate
  - Increase in corporate changes after negative economic shocks where mafia presence is high
- Indirect evidence of mafia infiltration into legal economic activities, leveraging on mafia's deep pockets
- Novel evidence on the mechanism through which mafia infiltrates the legal economy: effect is mostly driven by replacement of existing shareholders with new ones → acquisition of shares from owners in distress
- Effect concentrated in first months of crisis (no safety nets for firms + unexpected shock) and driven by “expected” sectors
- Results hold even when controlling for fine FEs which also capture most of the variation in public support to firms
- Next: shareholders' and firms' characteristics and explicit role for government aid

# Correlation between mafia and Covid-19

## Mafia and closed days during the Covid-19

	(1)	(2)	(3)
	Log(1+Closed days)		
Mafia	-0.019	0.023	0.009
	(0.021)	(0.072)	(0.066)
Observations	28046	28046	28046
Adjusted $R^2$	0.339	0.339	0.540
Year-Month FE	Yes	Yes	Yes
Region FE	No	Yes	Yes
Sector FE	No	No	Yes

Notes: Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

## Summary statistics

	(1)	(2)	(3)
	Mean	Standard Deviation	Observations
<b>Ownership changes</b> (province-sector-month)			
Log(1+Entry)	0.119	0.343	118,199
Log(1+Exit)	0.222	0.489	118,199
Log(1+Replacement)	0.271	0.560	118,199
Log(1+Reshuffle)	0.462	0.783	118,199
<b>Days of closures</b> (region-sector-month)			
Log(1+Closed days)	0.35	0.88	23,477
<b>Mafia index</b> (province)			
Mafia Index (MI rate)	0.24	0.21	105