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*Regioni tra sfide e inopportunità inattese*

The impact of lockdown on the decrease in startups in the Italian regions: an estimation of the missed new employment opportunities

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# 1. Introduction

The discovery of a novel **coronavirus** in late 2019 (Zhu et al., 2020) which led to the global pandemic of COVID-19 (WHO, 2020) in March 2020 had a **massive impact on the world economies** (Jordà et al., 2020; Ma et al., 2020; OECD, 2020a).

The particular type of shock due to **lockdown** represents an **unprecedented situation** that has yet to be studied in depth in the entrepreneurship literature.

Currently, **policies** have been focusing on protecting the existing industries and employment, with **less attention** to the future of economic activities, such as **startups** (Kuckertz et al., 2020).

During a recession, a **decline in startups** may generate **persistent effects at the macroeconomic level** (e.g., Sedláček and Sterk 2017, Gourio et al. 2016) because of a “**missing generation**” of firms (Clementi and Palazzo 2016; Siemer 2016). This can also impact on the speed of the recovery (Ayres and Raveendranathan 2016; Haltiwanger et al. 2013).



## 2. Theoretical background

In a period of **economic recession**, a **decline in startups** may have negative effects on employment, **slowing down the recovery of employment** (e.g., Elsby et al., 2011; Jaimovich & Siu, 2014; Haltiwanger et al., 2013) and leading to a **persistent void in aggregate employment** (e.g., Gourio et al., 2016; Sedláček, 2019).

With specific reference to the **COVID-19 pandemic and the related lockdown**, Sedláček and Sterk (2020) studied the effect of the disruption in startup activity on US employment.

**Several studies** have studied the **impact of the COVID-19 and the lockdown on unemployment** (e.g., Kong and Prinz, 2020; Gregory et al. 2020).

**For Italy**, Ascani et al. (2020) investigated the relationship between the spread of **COVID-19 and the geographical concentration of economic activities**. Musolino and Rizzi (2020) studied the socio, economic and environmental **determinants of the spread of COVID**. Unioncamere (2020) highlighted the COVID crisis is **hitting the entrepreneurship**.



### 3. Research questions

**RQ1:** *How many **employment opportunities** have been missed because of the **decrease in startups** during the two-months of **lockdown** (March-April 2020) in the Italian regions?*

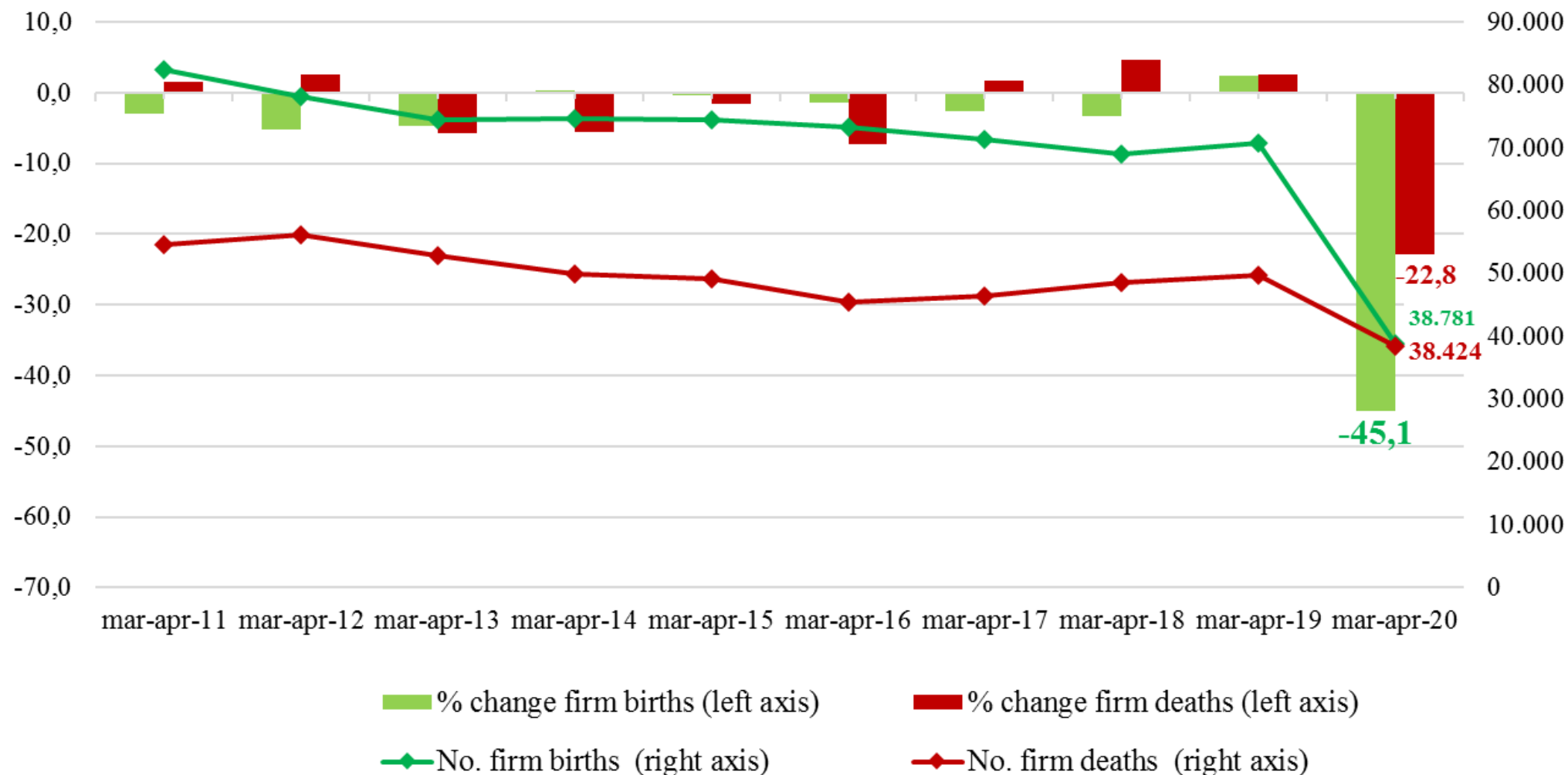
**RQ2:** *Is there a **COVID-19** geographically effect on startups decline?*

**RQ3:** *Does the possible nexus **COVID-19** and startups decline suffer of **endogeneity**?*



## 4. Background (1)

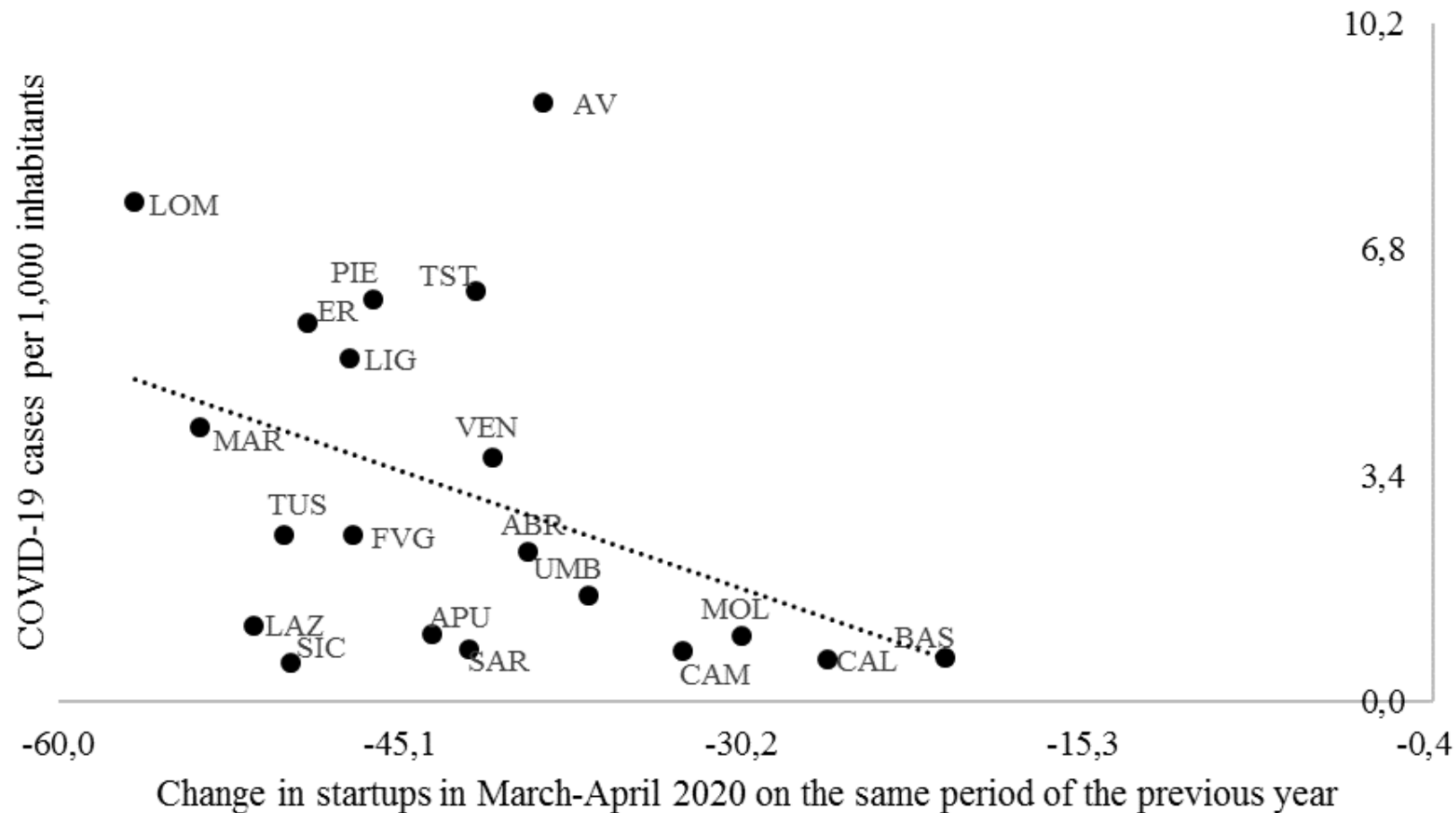
“Maledetta primavera”: The startup decline in Italy during the lock-down





## 4. Background (2)

COVID-19 and startups decline in the lockdown period in Italy by region



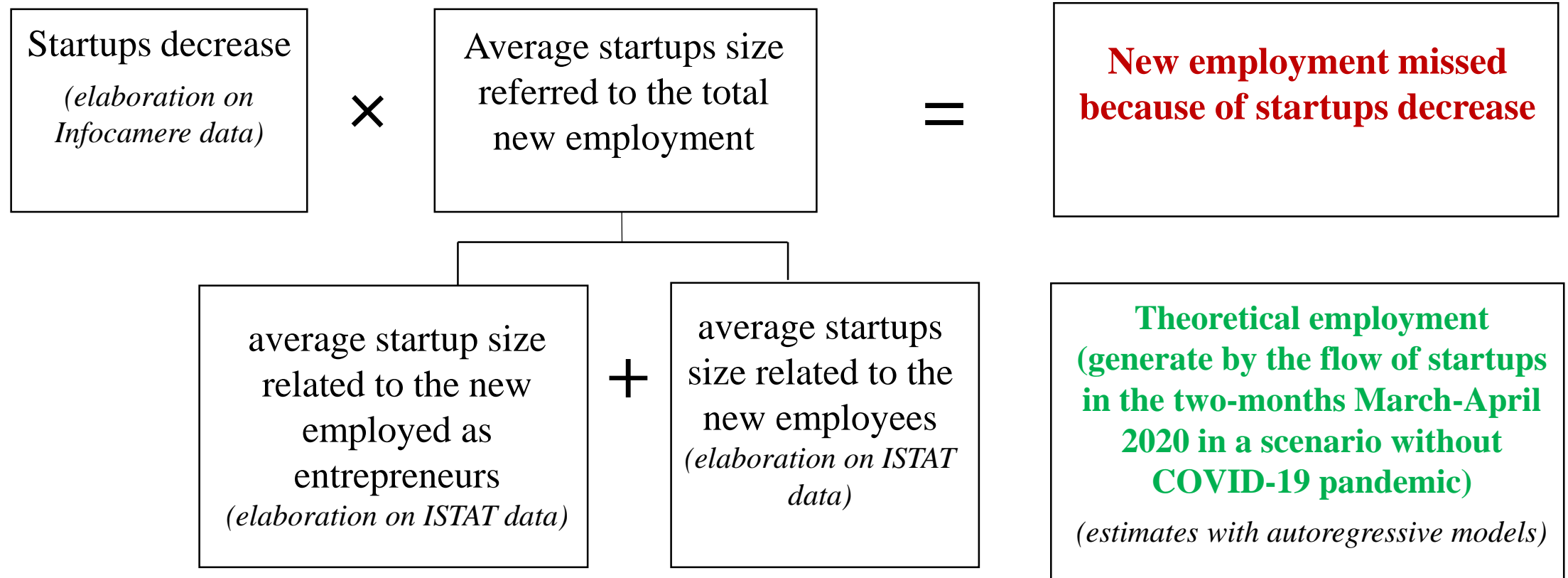


**RQ1:** *How many employment opportunities have been missed because of the decrease in startups during the two-months of lockdown (March-April 2020) in the Italian regions?*



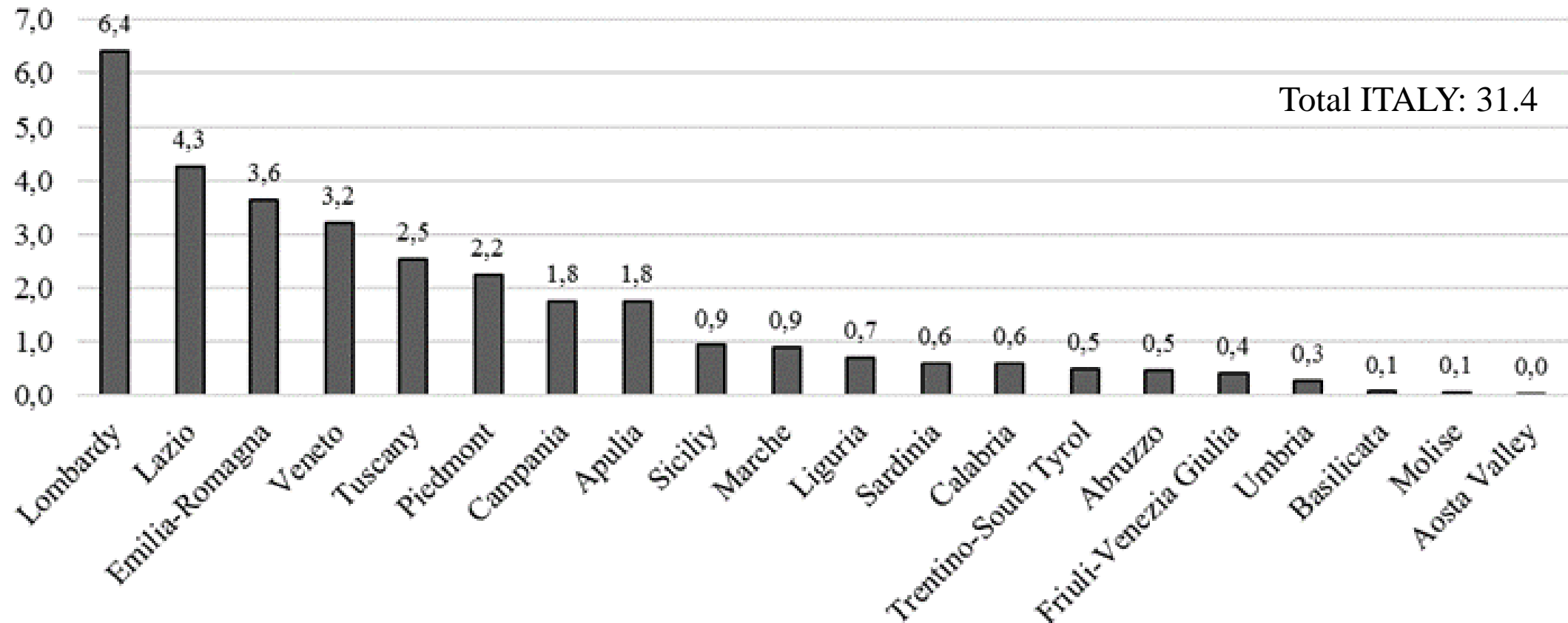


## 5. Method: Employment missed for startups decrease in the lockdown



## 6. Results: Employment missed for startups decrease in the lockdown (1)

*Regional ranking on the basis of the absolute values of employment missed*



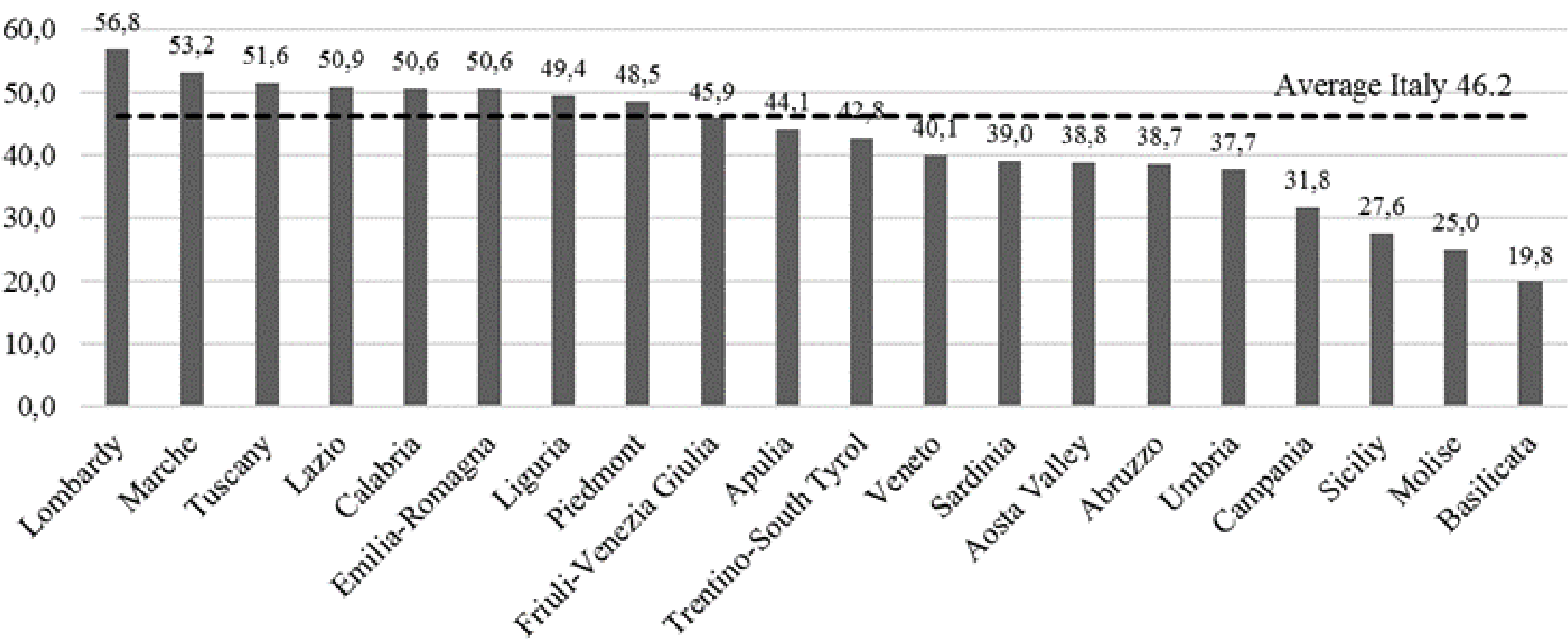
Note: Employment missed refers to the new employment not realized because of the startups decrease in the two-months March-April 2020. Theoretical employment refers to employment generate by the flow of startups in the two-months March-April 2020 in a scenario without COVID-19 pandemic.

Source: Authors' estimations



## 6. Results: Employment missed for startups decrease in the lockdown (2)

*Regional ranking on the basis of the % of employment missed on the theoretical employment*



Note: Employment missed refers to the new employment not realized because of the startups decrease in the two-months March-April 2020. Theoretical employment refers to employment generate by the flow of startups in the two-months March-April 2020 in a scenario without COVID-19 pandemic.

Source: Authors' estimations

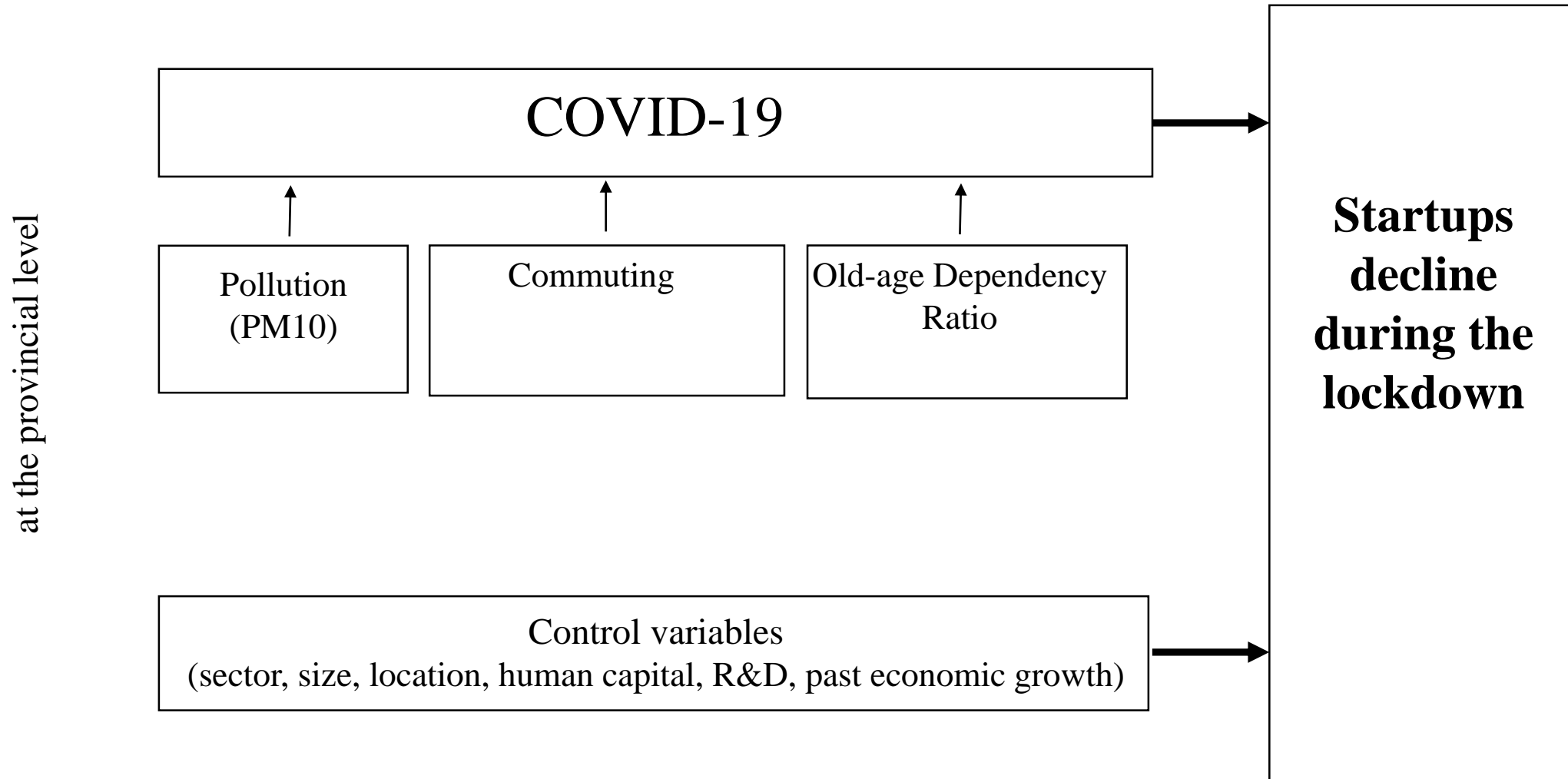


**RQ2:** *Is there a COVID-19 geographically effect on startups decline?*

**RQ3:** *Does the possible nexus COVID-19 and startups decline suffer of endogeneity?*



## 7. Conceptual framework: COVID-19 geographic effect of startups decline





## 8. Variables description (1)

Variable	Definition (at the provincial level unless specified)	Source
<i>Dependent variable</i>		
SU_decrease	Percentage change of firm births in the two months March-April 2020 compared to the two months March-April 2019	Unioncamere-Infocamere
Empl_miss	Share of the new employment missed because of the startups decrease in the two-months March-April 2020 on the theoretical employment	Authors' estimation
<i>Independent variables</i>		
COVID-19	COVID-19 cases per 1,000 inhabitants (30 April 2019)	Italian Civil Protection Department and ISTAT
<i>Control variables</i>		
Small	Share of employees in firms <50 employees on total employees (2019)	Unioncamere-Infocamere
HTM	Share of employees in high and medium-high technology intensive manufacturing sectors on total employees (2019)	Unioncamere-Infocamere
HKIS	Share of employees in high knowledge intensive service sectors on total employees (2019)	Unioncamere-Infocamere
HC	Share of population 15 years old and over with a tertiary degree on total population (2019)	ISTAT
R&D	Percentage of R&D expenditure on GDP (2017) (regional)	ISTAT
Growth	Value added growth (yearly average 2013-2019)	ISTAT and G. Tagliacarne
Location	Dummies variables taking value 1 if the firm operates in North, Centre or South Italy	Reserach Center



# 8. Variables description (2)

Variable	Definition (at the provincial level unless specified)	Source
<i>Instrumental variables</i>		
Commuting	Share of residents commute to work/study on total residents	Musolino & Rizzi (2020)
Old-age DR	Old age dependency ratio: number of individuals aged 65 and over per 100 people of working age (15-64)	Musolino & Rizzi (2020)
PM10	PM <sub>10</sub> values in µg/mc (yearly average 2011-18)	Musolino & Rizzi (2020)



## 9. Method

To test the geographically effect of COVID-19 spread on the startups decline we used an **OLS (Ordinary Least Squares)** method. Analitically:

$$Y_i = \beta_0 + \beta_1 COVID19_i + \beta_2 S_i + u_i \quad (1)$$

where:

$Y_i$  startups change (decrease in all provinces, expressed in positive values) occurred in the two-months March-April 2020 on the same period of the previous year, in the province  $i$ .

$COVID19_i$  indicates the number of COVID-19 cases per 1,000 inhabitants

$S_i$  is a vector of all control variables

$u_i$  is the error term that captures any other unknown factor affecting the startups decline

Regarding the **Instrumental Variables (IV) approach**, we used the Two Stage Least Squares (2SLS) estimator. The effects of the instruments on the endogenous variable are measured by the vector of parameters  $\beta_{21}$  in the auxiliary regression (first-stage), that is:

$$COVID19_i = \beta_0 + \beta_{21} Z_i + \beta_{22} S_i + v_i \quad (2)$$

where  $COVID19$  is the endogenous explanatory variable in (1),  $Z_i$  is the vector of instrumental variables and  $v_i$  is the residual.





# 10. Results and discussion (1)

Dep variable: *SU\_decrease*

	OLS (1)	OLS (2)	OLS (3)	IV-2SLS (4)
COVID-19	1.316*** (0.374)	1.171*** (0.375)	1.064*** (0.373)	2.427*** (0.749)
Small	0.007 (0.152)	0.050 (0.151)	0.116 (0.153)	0.152 (0.157)
HTM	0.228 (0.376)	0.023 (0.384)	-0.206 (0.397)	-0.507 (0.431)
HKIS	-0.274 (0.268)	-0.206 (0.265)	-0.117 (0.266)	-0.154 (0.273)
HC	0.489 (0.419)	0.398 (0.415)	0.278 (0.414)	0.505 (0.438)
R&D		5.882** (2.911)	4.934* (2.911)	3.218 (3.096)
Growth			4.016* (2.083)	2.884 (2.204)
<i>Instrumental variables</i>				
Commuting				0.389*** (0.085)
Old-age DR				0.137** (0.065)
PM10				0.121** (0.053)

*continues*



## 10. Results and discussion (2)

	OLS (1)	OLS (2)	OLS (3)	IV-2SLS (4)
Exogeneity: Wu-Hausmann (F-statistic)				4.939**
Instruments relevants (F-statistic)				10.546***
Overidentification test, Sargan (Chi2)				0.352
Obs.	99	99	99	99
R <sup>2</sup>	0.204	0.237	0.267	0.160

*Note:* Dependent variable *SU\_decrease*. Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, p<0.1. We report also the coefficients of the instrumental variables in the first-stage regression. Exogeneity test for the instrumented variable: Wu–Hausmann test, significance means to reject the hypothesis of exogeneity of the instrumented variable. Instruments relevance: *F*-test on first-stage regression, significance, with a *F*-value > 10, means to reject the hypothesis of irrelevance of the instrumental variables. Sargan test for the overidentification restriction, no significance means to not reject the hypothesis of exogeneity of the instrumental variables.

*Source:* Authors' elaboration



# 10. Results and discussion (3)

Dep variable: *Empl\_miss*

	OLS (1)	OLS (2)	OLS (3)	IV-2SLS (4)
COVID-19	1.384*** (0.423)	1.205*** (0.422)	1.085** (0.421)	2.652*** (0.845)
+ <i>controls</i>				
Exogeneity: Wu-Hausmann (F-statistic)				5.158**
Instruments relevants (F-statistic)				10.545***
Overidentification test, Sargan (Chi2)				0.012
Obs.	99	99	99	99
R <sup>2</sup>	0.166	0.208	0.239	0.123

*Note:* Dependent variable *Empl\_miss*. Standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ ,  $p < 0.1$ . Exogeneity test for the instrumented variable: Wu–Hausmann test, significance means to reject the hypothesis of exogeneity of the instrumented variable. Instruments relevance: *F*-test on first-stage regression, significance, with a *F*-value > 10, means to reject the hypothesis of irrelevance of the instrumental variables. Sargan test for the overidentification restriction, no significance means to not reject the hypothesis of exogeneity of the instrumental variables.

*Source:* Authors' elaboration



# 11. Sum-up and policy implications

## THE MISSED NEW EMPLOYMENT OPPORTUNITIES

- We estimated that **31,400 people missed out on employment opportunities during the two-months of lockdown.**
- The missed employment in only two months corresponds to **1.2% of the total Italian unemployment** registered at the end of 2019.

## THE GEOGRAPHIC EFFECT

- There is a **significant effect of the COVID-19 spread on the startup decline** as well as on the missed new employment opportunities at the provincial level.
- **COVID-19 negatively affected the most competitive Italian provinces**, in terms of innovation and economic growth registered in the last five years.

***The need to sustain entrepreneurship. In view of the positive benefits provided by startups, ITALY CANNOT AFFORD A LOST GENERATION OF FIRMS.***

## 12. Limitations and future research

### **Limitations**

- We assume that firms that might have been started would have had the same employment potential as existing startups.
- We did not take into account the failure rate of the firms that might have been started, thus negatively influencing the job creation.
- Moreover, we did not analyze the decline in startups in terms of the profile of the entrepreneurs.

### **Future research**

- ✓ studying the impact of lockdown and COVID-19 with particular regard to entrepreneurship among women and young people
- ✓ studying the territorial differences in the potential recovery of startups activity together with the firms' resilience (on the basis of the number of closures) during post-lockdown.

Thank you for your attention