

# Anatomy of Firms' Margins of Adjustment: Evidence from the COVID Pandemic

Elías Albagli, Andrés Fernández, Juan Guerra-Salas, Federico Huneus

Research Department – Central Bank of Chile

**Eleventh BIS Consultative Council of the Americas Research Conference**

**“The Economics of the Covid-19 Pandemic”**

Disclaimer: Views do not necessarily correspond to those of the Central Bank of Chile or its Board members.

November, 16 - 2021

# Motivation

- The COVID-19 crisis has been a **large macro shock** with substantial **reallocation of resources**
- The crisis in **Chile**:
  1. Sharp contraction followed by **V-shaped recovery**
  2. Considerable size of **monetary, fiscal and credit policies**
  3. Significant **distributional impact** of the crisis
- What is the **role of firm** behavior in these dynamics?
  - Literature so far offers only partial evidence on this
  - Usually study subset of firms, or limited information, or subset of margins of adjustments
- This paper: we **trace the real effects of the pandemic on firms' micro patterns** that build into the macro dynamics
  - Study simultaneously nearly all margins of adjustment of firms
  - Study the role of policies

# How we do it

- We do this for firms in Chile for which we have a **unique administrative dataset** that allow us to document their **activities in all markets** they participate in and for the **universe of firms**
  - 1. We uncover a set of **stylized facts** on firms' margins of adjustment in the wake of the shock and through the economy's recovery path along several markets (extensive/intensive margins) :
    - Output market: **entry/exit, sales**
    - Intermediate inputs market: **suppliers' links**
    - Labor market: **employment**
    - Physical capital goods market: investment
    - Credit market: **domestic bank credit**
    - This allows us to also quantify the micro sources of **firms' productivity** under COVID
    - We document the **heterogeneity** of these facts across firms' **sector and size**
  - 2. We also identify the **role of credit & employment protection policies** in these adjustment

# Key Takeaways

1. The sharp contraction in economic activity induced by the COVID shock in Chile, and the subsequent fast recovery, brought about **significant adjustments by firms** along **several markets** and **margins** (extensive/intensive), and was characterized by **considerable heterogeneity across sectors and firms' sizes**
2. **Policies that supported credit** -coupled with sovereign guarantees- as well **protected employment mitigated these adjustments** and appear to have **played a role in the recovery of firms' sales, their exit & re-entry decisions, and employment**. A corollary of credit policies is a **considerable increase in firms leverage**.

# Outline

1. Motivation
2. Data
3. Firms' margins of adjustment: stylized facts
4. The role of policies
5. Productivity

# Data

Massive **effort by the Central Bank of Chile of creating a repository with various administrative datasets** owned by the State to support policy-making, statistics and research.

For this project we merged **five dataset** (anonymously)

## 1. Firm Production Dataset

Standard tax form (F29) that firms report monthly on total revenues, materials expenditures, investment. Source: Chilean IRS (SII)

## 2. Firm-to-Firm Intermediate Input Transactions Dataset

All private firm-to-firm transactions starting from 2015 until last month, includes value flows, prices, products/services traded. This information allows to measure investment at a transaction level. Source: Chilean IRS (SII)

## 3. Firm-to-Bank Credit Transactions (stocks and flows) Dataset

All formal credit transactions starting from 2012 until last month, includes information on interest rates and other credit details. Also, for this crisis, Banks are giving information on applications to public credit guarantee loans. Source: Financial Regulatory Commission (CMF)

## 4. Employer-Employee Dataset

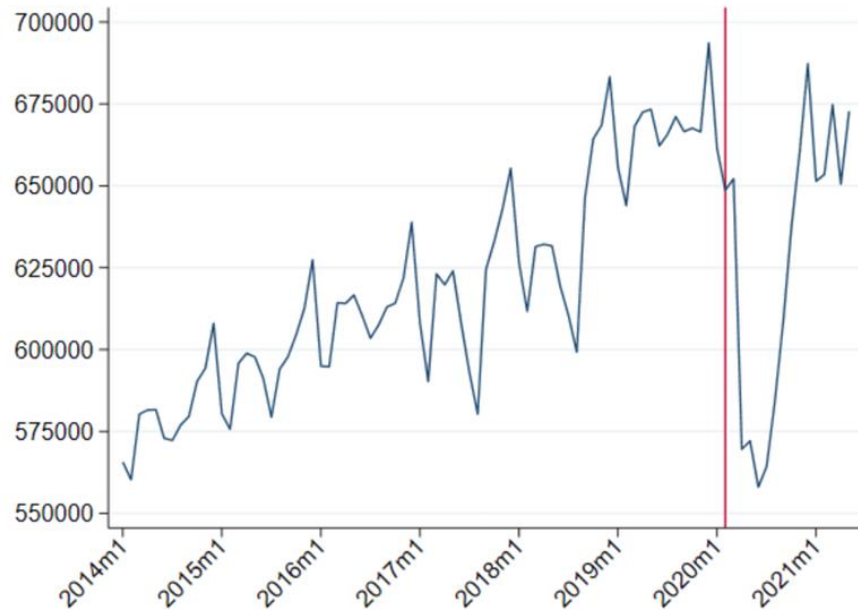
Firm-month level information on ending formal employer-employee contracts. Source: Administrator of Unemployment Insurance

## 5. Credit & Employment Policies' Datasets Firm/level

Firm-level data on FOGAPE credits & Employment Protection Law (EPL)

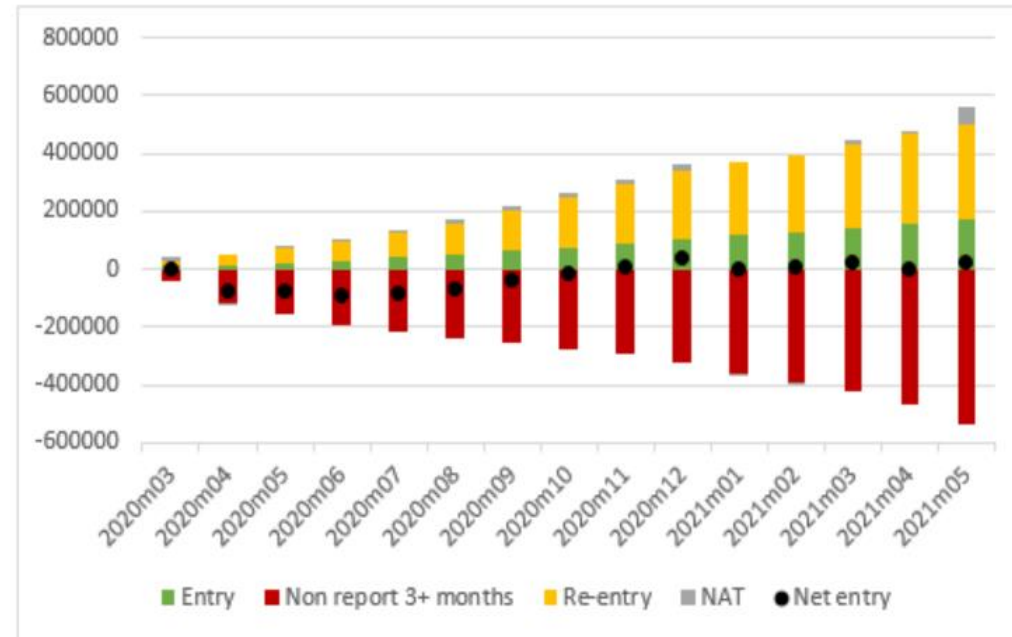
# Output Market: Exit and Re-Entry

Number of firms \*



Note: (\*) Red vertical line is February 2020. A firm is a single tax ID with positive sales. Only firm that belong to National Accounts directory of firms. Source: Monthly tax form F29.

Decomposition: Entry/Exit/Re-entry \*



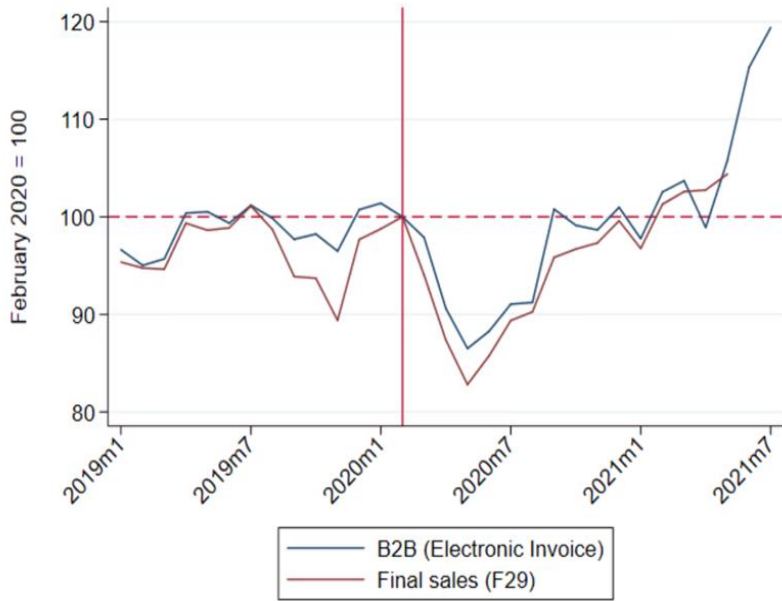
Note: (\*) Numbers refer to the change in the number of firms since Feb. 2020; NAT is non allocated turnover. Source: Monthly tax form F29.

- **Contractionary Phase: Sharp decline of 14% (13%) of firms reporting positive sales between February and June 2020**
- **2 of every 3 firms that exited re-entered, and the median length of exit was 5 months between 2020.M3 and 2021.M5**
- Substantial heterogeneity across sectors and size: **Almost all accounted for by small firms**
  - Recovery lead by **manufacturing and commerce**

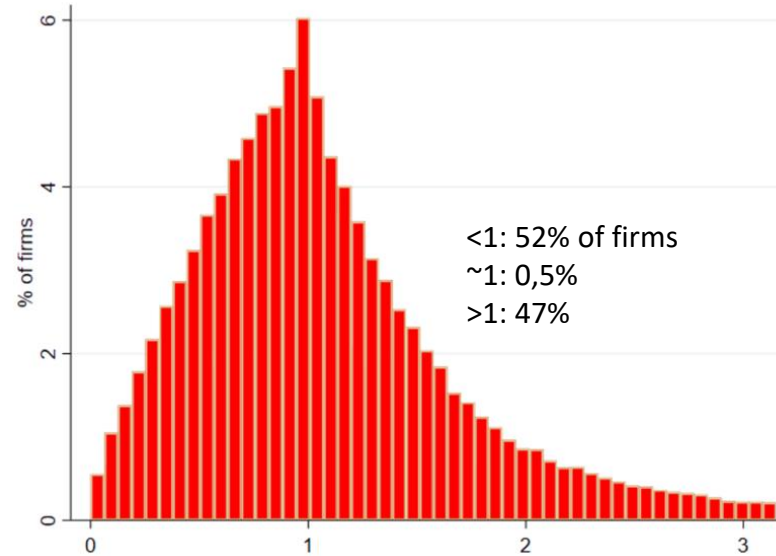
[Details](#)

# Output Market: Sales

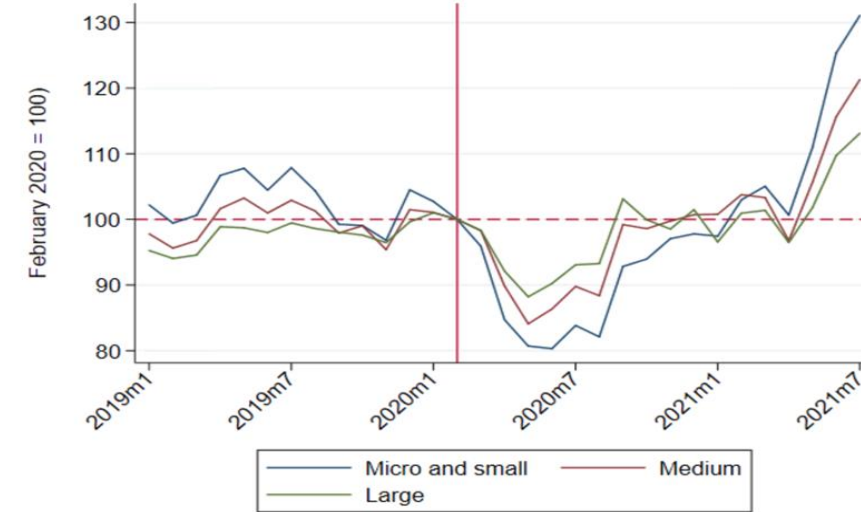
Sales \*



Sales Growth Distribution \*\*



Size



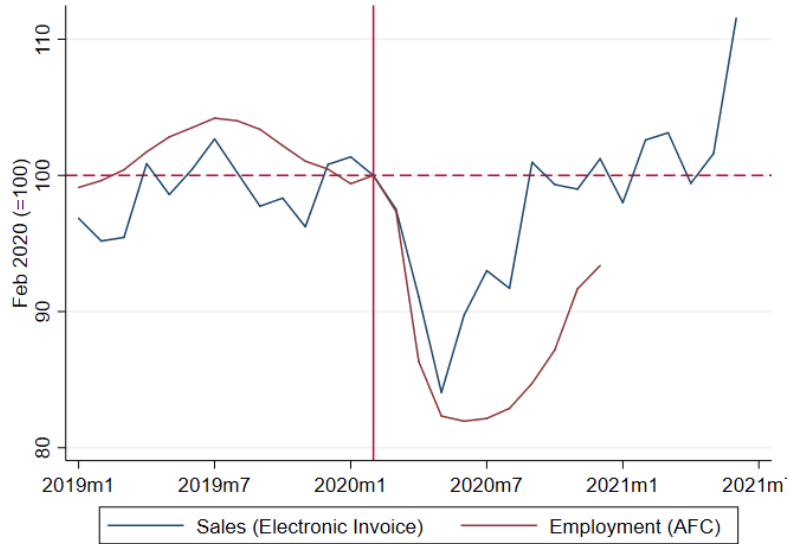
Note: (\*) Sales are normalized so that Feb./2020 is 100; (\*\*) Distribution refers to the ratio of sales for March-May 2021 Vs 2019. Source: Monthly tax form F29 and Electronic Invoice .

- **Two phases also in sales:** Hard fall in sales with a trough in May/20 in both final sales and B2B sales; and a steady rebound with a pre-pandemic recovery by end of 2020
- **Strong heterogeneity:** less than half of firms have recovered relative to 2019 (more heterog. than in [other 2-year periods](#))
- Recovery holds across all firm size, but **smaller firms –the hardest hit- lead the recovery.** By sectors, manufacturing and commerce have also lead it.

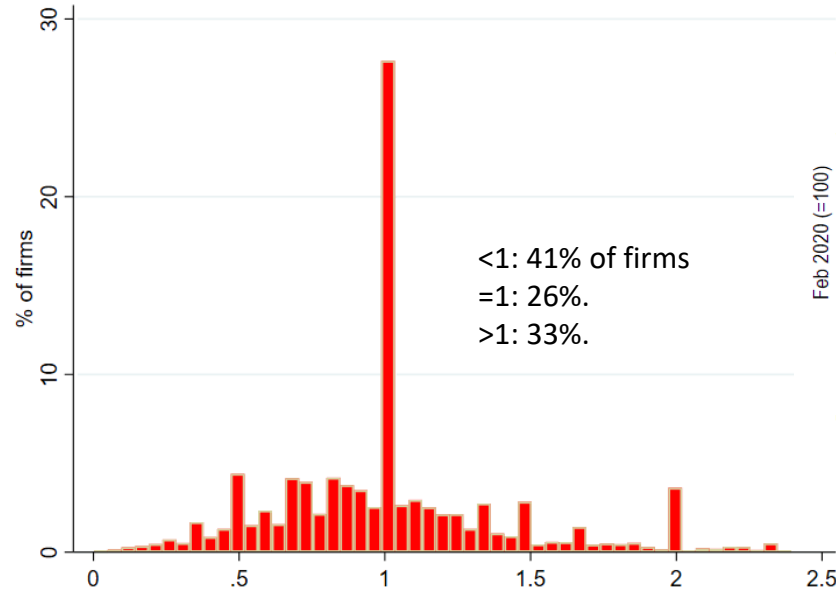


# Labor Market: Employment

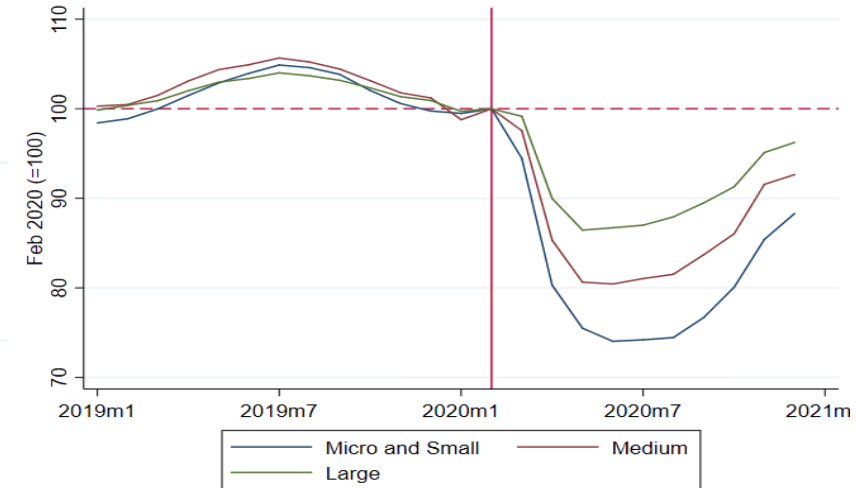
### Employment & Sales \*



### Employment Growth Distribution \*\*



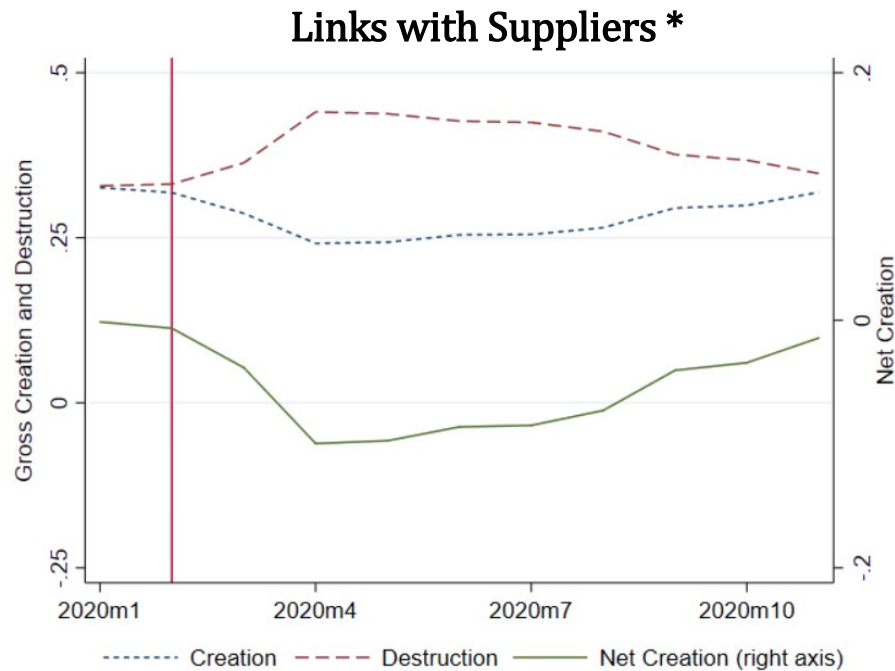
### Employment & Size



Note: (\*) AFC removing workers from LPE; (\*\*) Distribution refers to the ratio of firm's employment for Oct-Dec 2020 vs Oct-Dec 2018. Source: Monthly tax form F29; Electronic Invoice; and employer-employee dataset

- In the contractionary phase, **employment fell as much as sales and has been lagging behind** in the recovery phase.
- Only **33% of firms** are hiring more than pre-covid
- Magnitude of **contraction ordered by size**. Recovery lead by manufacturing and commerce.

# Intermediate Input Market: Suppliers' Links



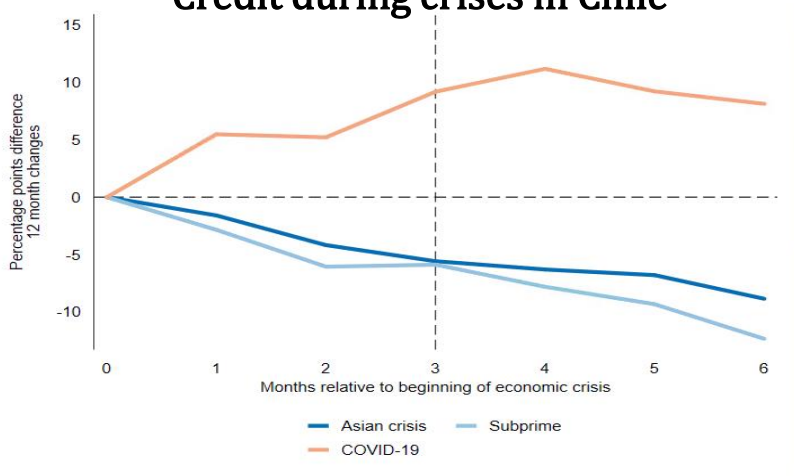
Links Destroyed in:	Share of Links Destroyed	Share of Links Recovered Afterwards
January	33	35
February	33	35
March	36	33
April	44	38
May	44	37
June	43	37
July	42	35
August	41	33
September	38	30
October	37	26
November	35	22

Note: (\*) Annual growth rate of number of firms' links. Source: Electronic Invoice .

- There was **strong net destruction of links** that bottomed in 2020.M4, with links decreasing by close to 10% in anual growth terms, driven by a **slowdown of gross creation** and a **sharp rise in gross destruction**
- Yet **by the end of 2020, the recovery was complete** and firms had rebuilt their connections with suppliers
- At the peak, **close to half of the links were destroyed**, yet nearly **one third of those recovered**

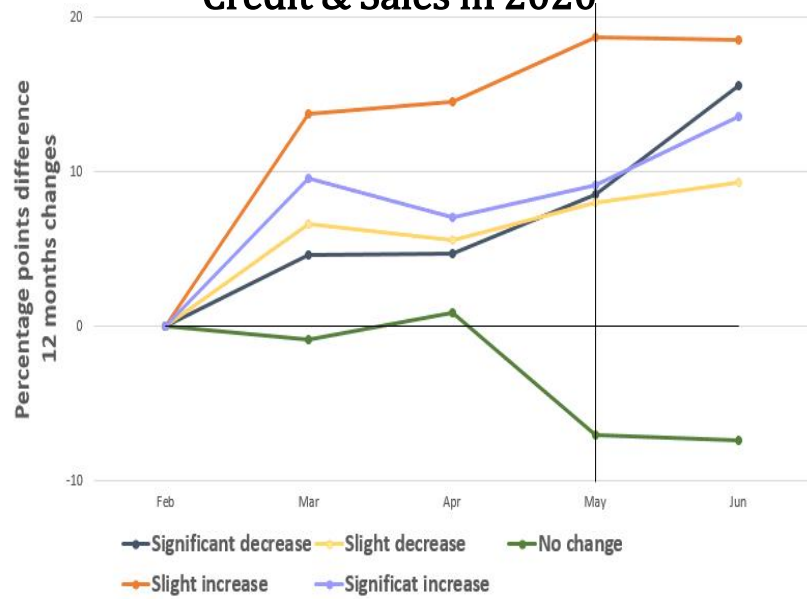
# Credit Market and Leverage

Credit during crises in Chile \*



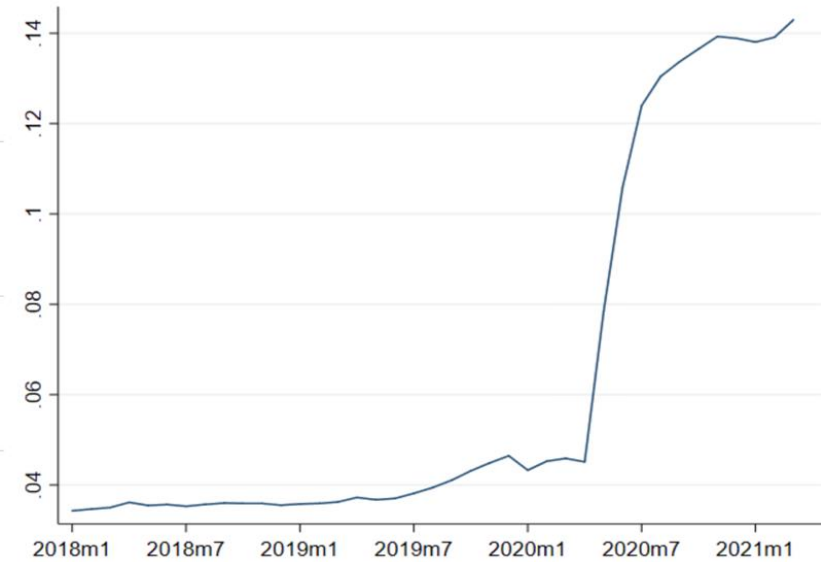
Note: (\*) 12 month growth for each month after the onset of the crisis (t=0), defined as the month when monthly GDP index (IMACEC) displays negative growth. For COVID-19, t=0 is February.

Credit & Sales in 2020 \*



Note: (\*) Total bank credit: includes traditional and FOGAPE; (\*\*) Ratio of debt to yearly sales (between 2018.Q3 to 2019.Q3) Source: Financial Regulator Commission and tax form F29.

Leverage: Bank Debt to Sales\*\*



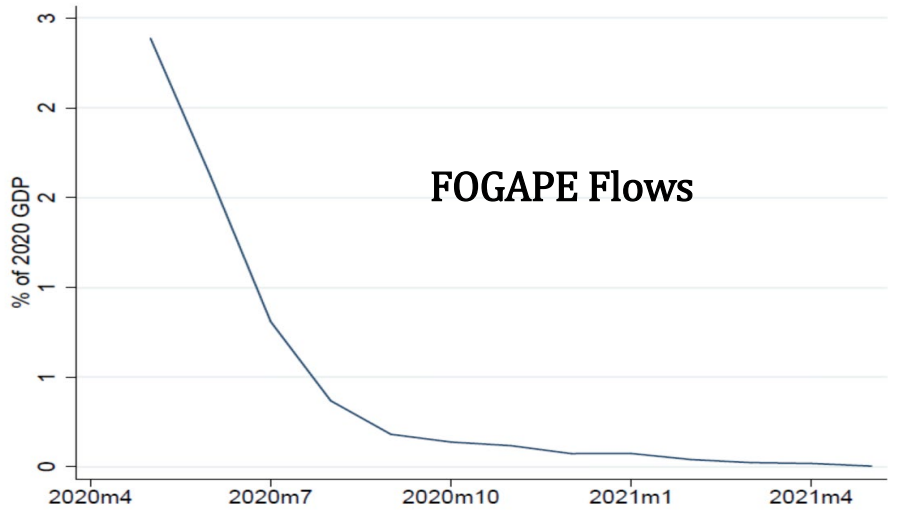
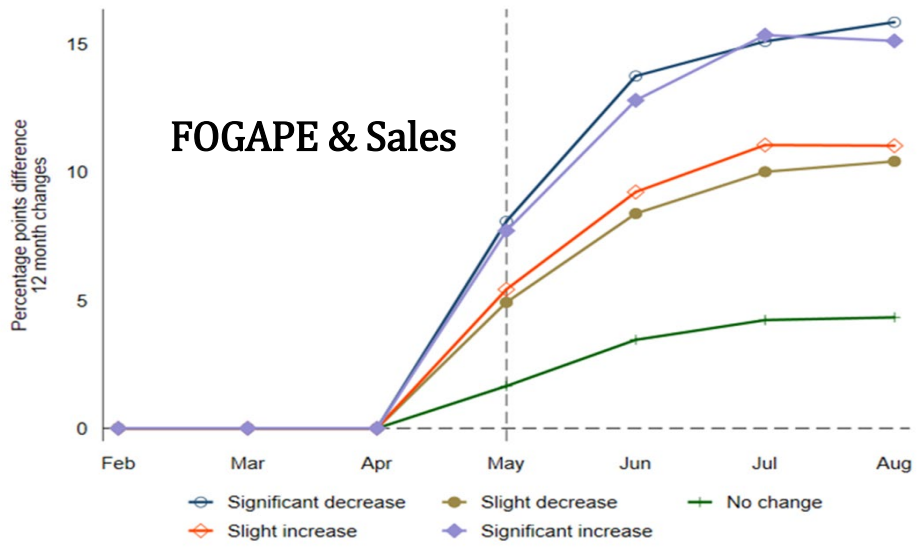
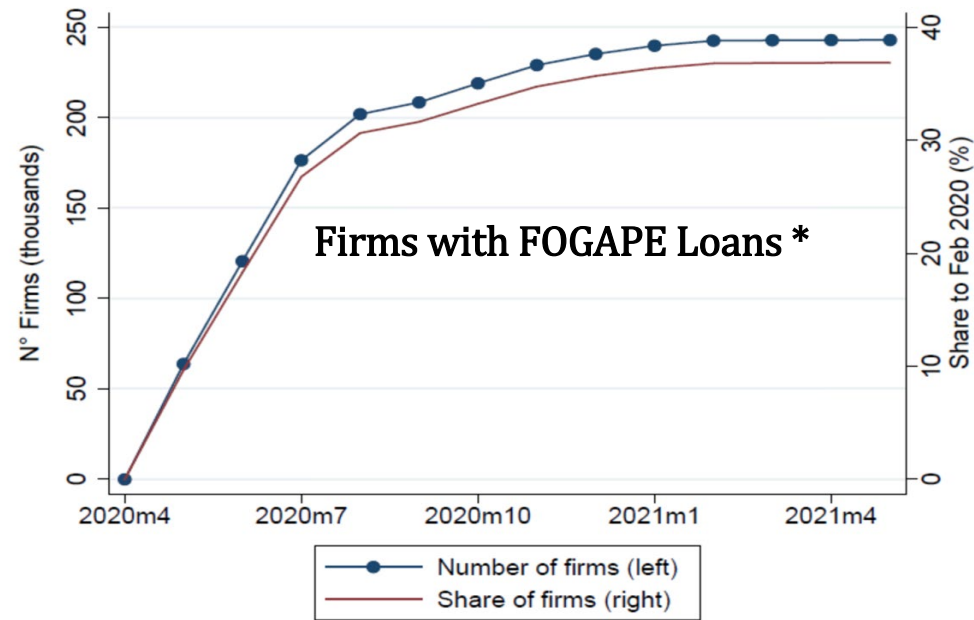
- **Domestic Bank Credit was countercyclical during COVID**, unlike in previous crises
- **Credit flowed non linearly**: both to highly impacted firms as well as those that with higher sales
- In turn, this **triggered an unprecedented three-fold increase in leverage**, across the board

# Outline

1. Motivation
2. Data
3. Firms' margins of adjustment: stylized facts
4. The role of policies
  - FOGAPE: Loans with sovereign guarantees
  - LPE: Fast and cheap furlough mechanism
5. Productivity

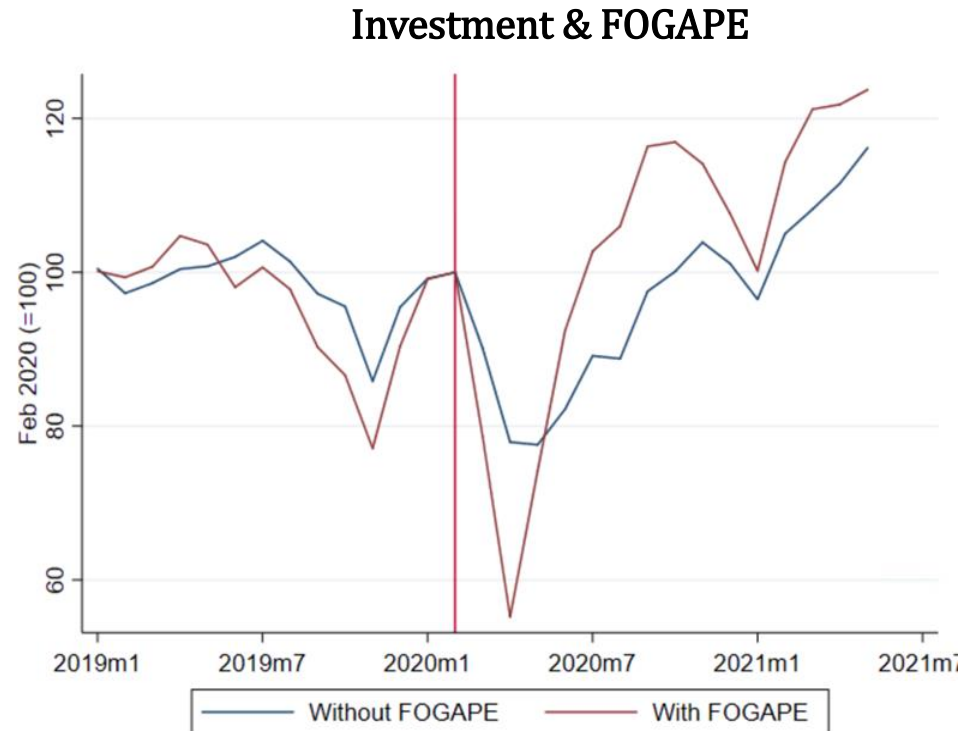
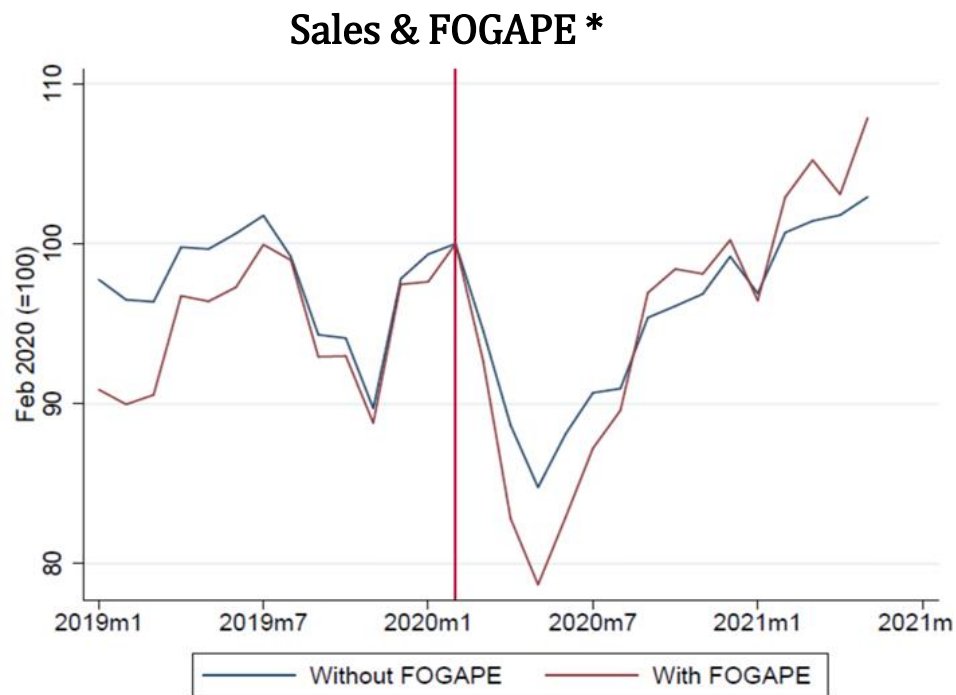
# FOGAPE-Sovereign Guarantees: Access

- **Widespread access of FOGAPE loans:** Close to 40% of all firms (~250k) at some point obtained one
- **Amount accessed was strongest at the onset of the program in May 2020** –with a peak flow of 3% of GDP– and has been gradually decreasing
- Credit flowed **largely to firms with significant decreases in sales**
- Concentrated in **small firms, and commerce** ([details](#))



Note: (\*) Firms that at a given month had gotten a FOGAPE loan; Source: Financial Regulator Commission and tax form F29.

# Macro Event Study of Public Credit Guarantee (FOGAPE)

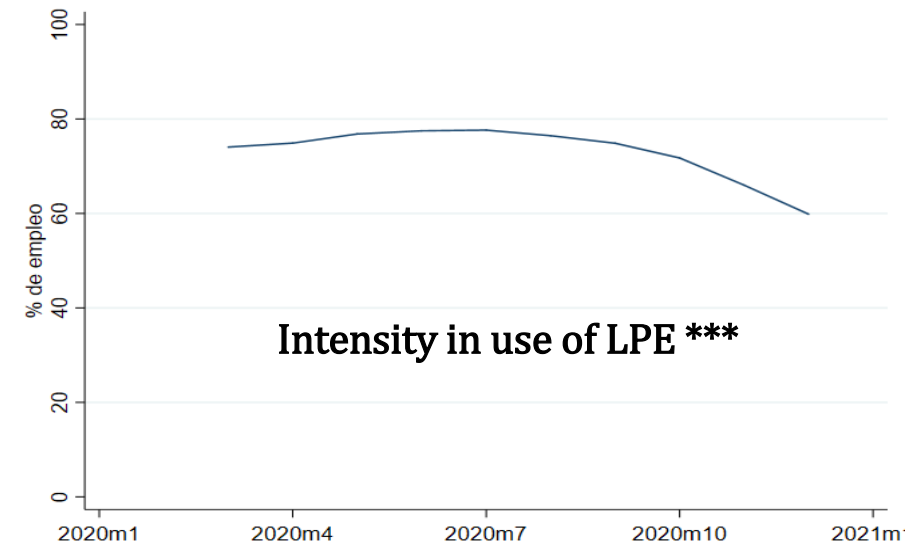
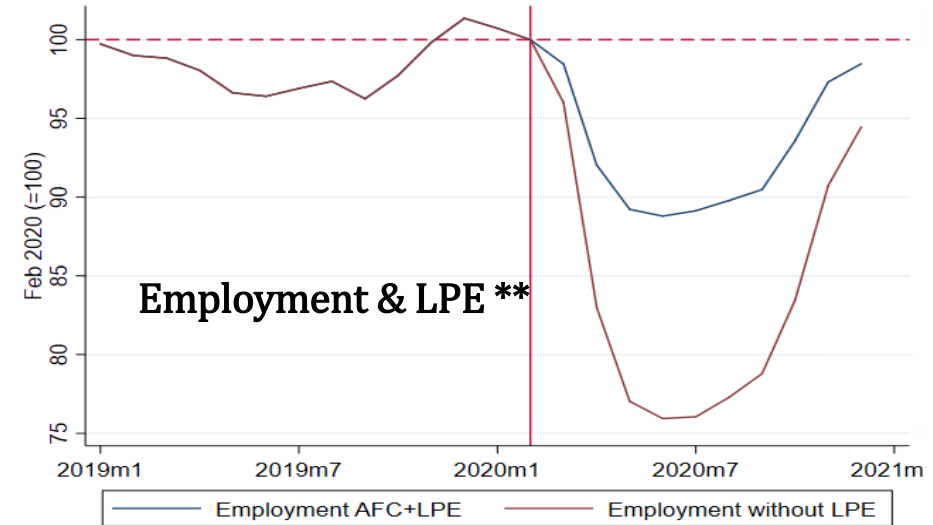
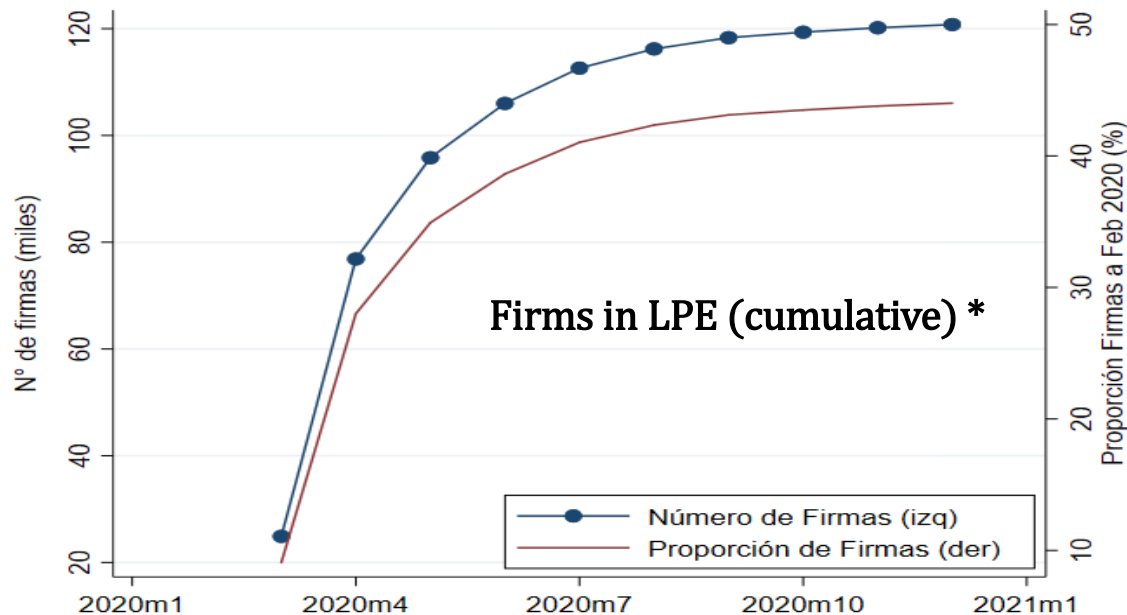


Note: (\*) Firms that at a given month had contracted a FOGAPE loan; Source: Financial Regulator Commission and tax form F29.

- **Firms that accessed FOGAPE loans saw their sales drop more** –with a trough in April of about 20% relative to February– than firms that did not access.
- Yet firms **they have also rebounded more** than others
- Qualitatively the **same can be said about investment**
- Currently working on a **micro event study design**

# LPE – Furlough Program: Access

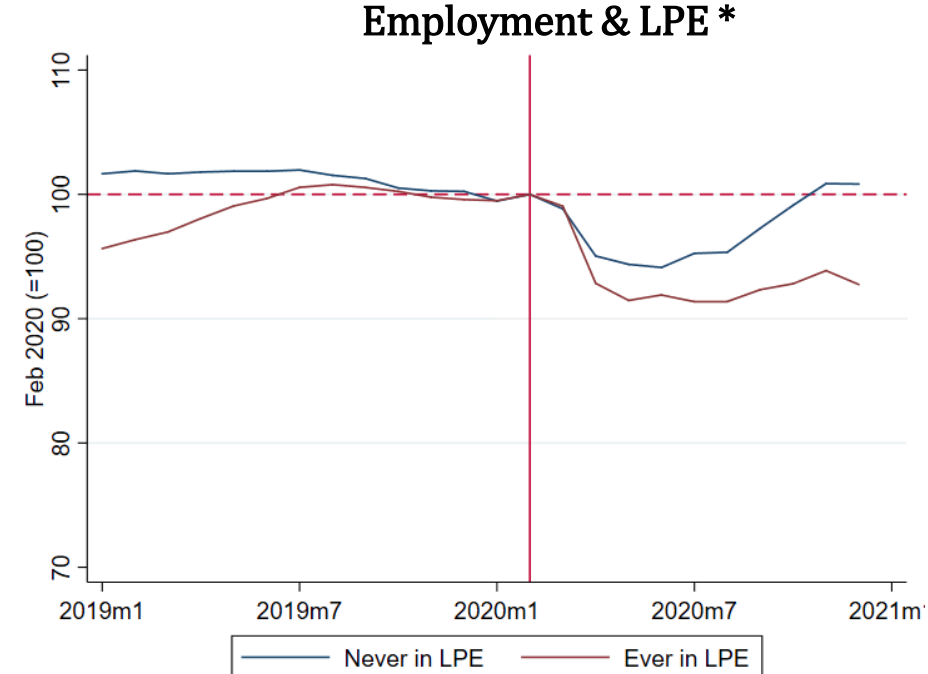
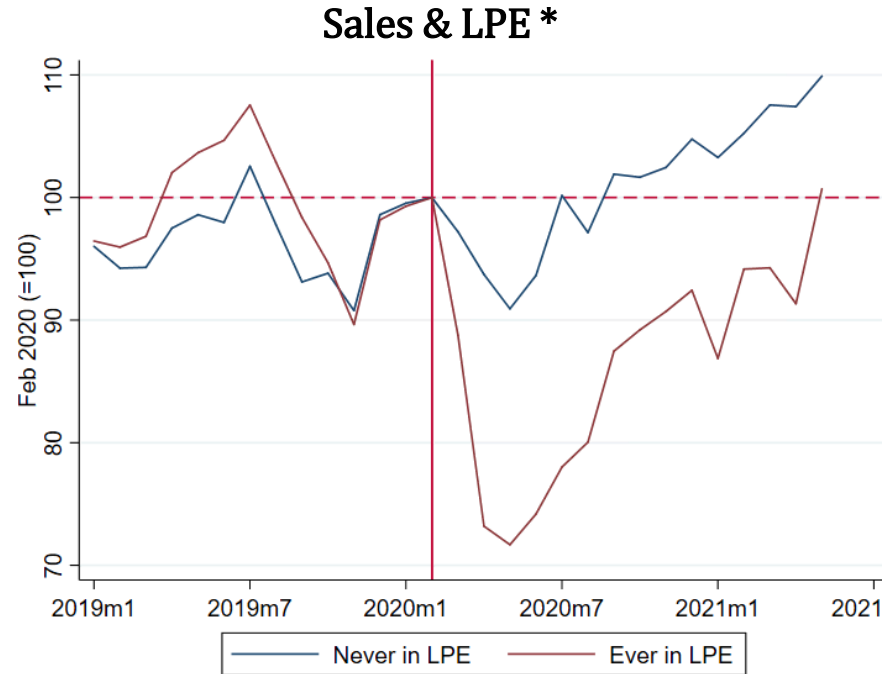
- **Widespread access to employment protection (LPE):** Some ~120k firms accessed LPE (nearly 45% of firms with at least one employee)
- At the trough, about **10% of employment was lost** and an **additional 15% was enrolled in LPE**
- Among firms that accessed LPE, close to **80% of payroll was enrolled in LPE** by mid-2020.
- Allowed to **maintain the same turn-over** at the firm than in a normal year (nearly 75%)
- Concentrated in **small firms**, and **commerce** ([details](#))



Note: (\*) Firms with at least one worker enrolled in LPE. (\*\*) Not seasonally adjusted. (\*\*\*) Percent of payroll under LPE among firms that accessed the policy.

Source: Employer-employee dataset, and employment protection program (LPE) dataset.

# Macro Event Study of Furlough Program (LPE)



Note: (\*) Sales and employment of firms that accessed LPE in any month during the period March-December 2020. Employment includes workers enrolled in LPE. Seasonally adjusted. Source: tax form F29, employer-employee dataset, and employment protection program (LPE) dataset.

- We identify **firms that had any access to employment protection (LPE) in Mar-Dec** and track their performance before and after the crisis hit. Among firms that accessed LPE:
  - **Sales dropped substantially**—with a trough in May of about 30% lower sales than in February, and a lagged recovery followed that of firms that did not access the policy
  - The **decline in employment was like that of firms that did not access LPE** (workers under LPE are considered employed)
  - However, employment has stayed below pre-pandemic level (details)



# Econometric Analysis

$$Y_{i,July} = \alpha_{t(i)} + \alpha_{s(i)} + \alpha_{a(i)} + \alpha_{c(i)} + \beta_1 \text{Fogape}_{i,Apr-Jun.} + e_i \quad (*)$$

		No Report		Reentry	
		1	2	1	2
FOGAPE	Change debt stock	-0.040 *** (0.0085)		0.035 *** (0.0246)	
	Dummy Fogape		-0.005 *** (0.0013)		0.013 *** (0.0035)
N. Obs		354,729	354,729	76,419	76,419

[Variables](#)

[Timing](#)

[Sample](#)

[Des. Stats](#)

- No Report:
  - One SD increase in the change of debt stock reduces the probability of no report by 0,2%.
  - **Accessing to FOGAPE credits between April-June/2020 is associated with a decrease of 0,5% in the probability of not reporting sales in July, relative to firms that do not access the policy (unconditional probability of no report is 6%)**
- Reentry:
  - One SD increase in the change of debt stock increases the reentry probability by 0,2%.
  - **Accessing FOGAPE credits between April-June/2020 is associated with a 1,3% increase in the reentry probability, relative to firms that do not access the policy (unconditional probability of re-entry is 10,8%)**

(\*) Fixed effects: Firm size ( $\alpha_t$ ), sector ( $\alpha_s$ ), age ( $\alpha_a$ ), and municipality ( $\alpha_c$ )

# Econometric Analysis

		Employment			
		1	2	3	4
FOGAPE	Change debt stock	0.254 *** (0.0235)			
	Dummy Fogape	0.019 *** (0.0032)			
LPE	Ratio LPE	0.146 *** (0.0041)			
	Dummy LPE	0.204 *** (0.0028)			
	Constant	-0.203*** (0.0014)	-0.202*** (0.0015)	-0.154 *** (0.0016)	-0.277 *** (0.0017)
	N. Obs	145,884	145,884	132,583	145,884
	Adj R2	0.048	0.048	0.029	0.081

[Variables](#)

[Timing](#)

[Sample](#)

[Des. Stats](#)

- FOGAPE:
  - A 1% (1 SD) increase in the stock of debt, generates a rise of 0,3% (1.3%) in total employment
  - **Access to FOGAPE raised employment by 1.9% (see constant is -20.2%)**
- LPE:
  - A 1% (1 SD) increase in the ratio of workers under LPE is linked to an increase of 0.1% (4.4%) in employment
  - **Access to LPE is linked to an increase of about 20% in employment.**

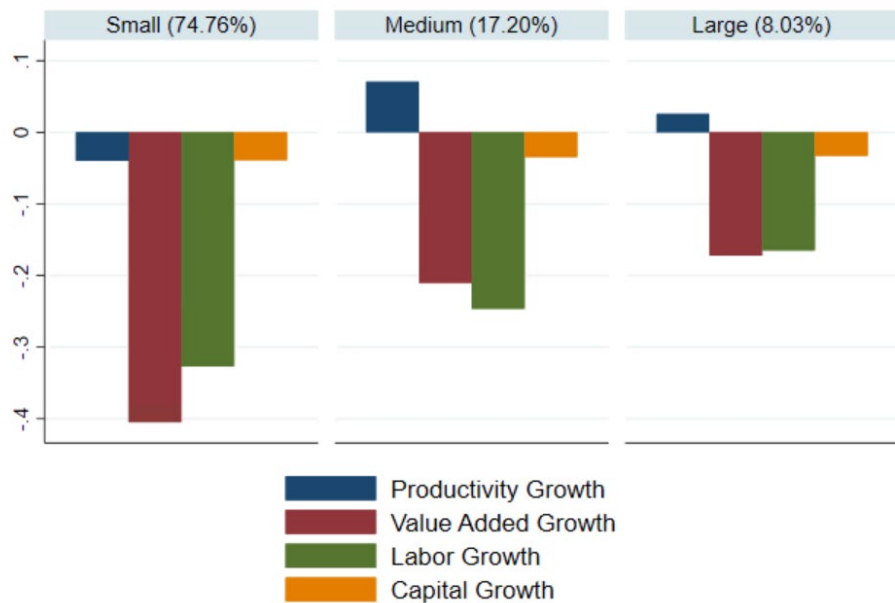
# Outline

1. Motivation
2. Data
3. Firms' margins of adjustment: stylized facts
4. The role of policies
5. **Productivity**

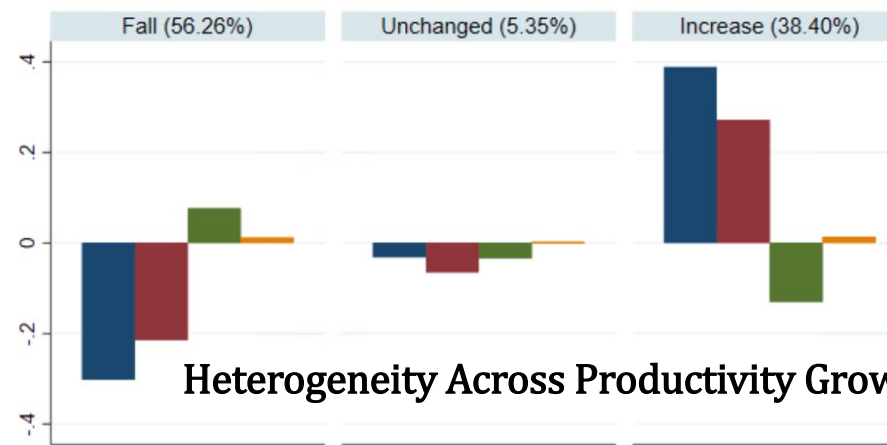
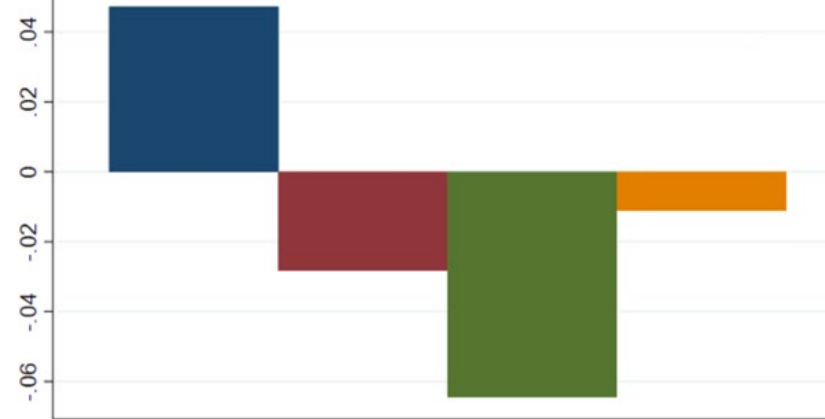
# Productivity

- Productivity growth driven by stronger decline in employment than value-added
- Masks substantial heterogeneity. 38% of firms increased their productivity, including médium and large firms

Heterogeneity Across Firm Size\*



Aggregate Productivity Growth & Decomposition\*



Heterogeneity Across Productivity Growth\*

Note: (\*) Productivity estimated at firm-year level using ACF (2015) production function estimation strategy, using Cobb-Douglas functional form with capital and labor.

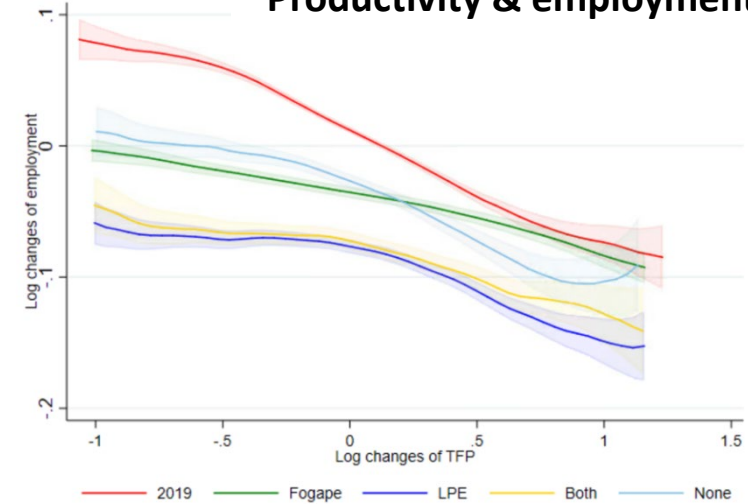
# Productivity

- **FOGAPE**: linked to **increases in productivity** and strong **correlation between productivity and investment**
- **LPE**: linked to **productivity and employment falls**

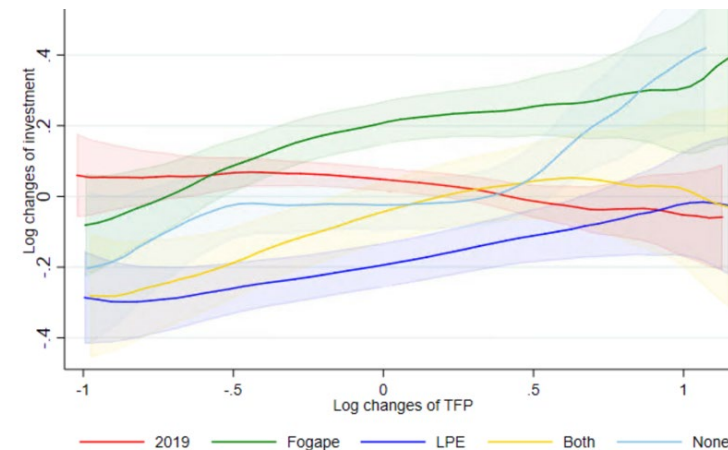
## Heterogeneity in productivity growth across policies\*



## Productivity & employment \*\*



## Productivity & investment \*\*



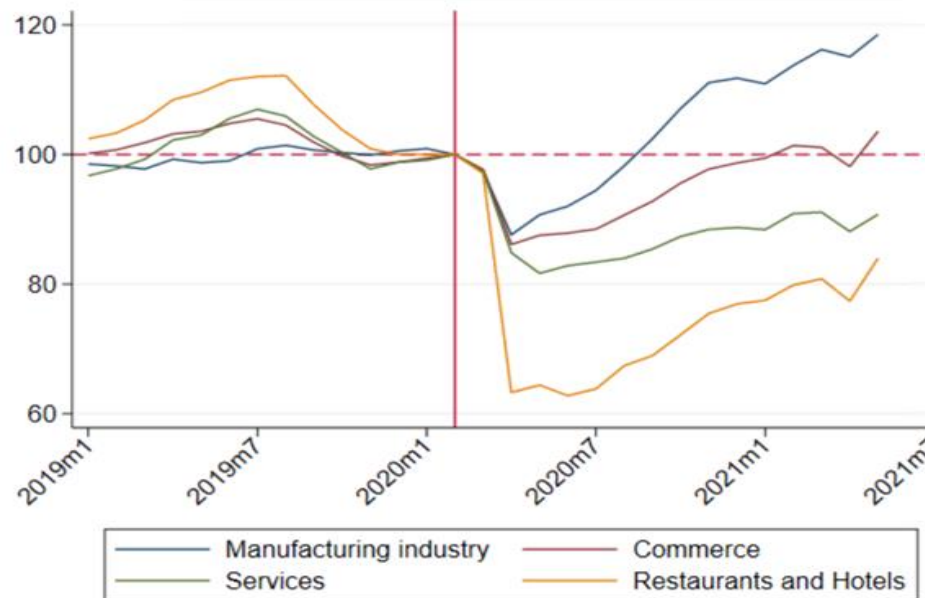
Note: (\*) Annual productivity growth in 2020 and annual growth of each variable employed in its computation, for each group of firms. Firms are grouped according to the policies they accessed during March-June 2020. Numbers in parenthesis denote the share of value added of each group. Firm-level productivity is aggregated using each firm's value added as its weight. (\*\*) Correlation between firm-level productivity growth (X axis) and employment and investment growth (Y axis). Non-parametric correlations with local linear regressions.

THANKS!

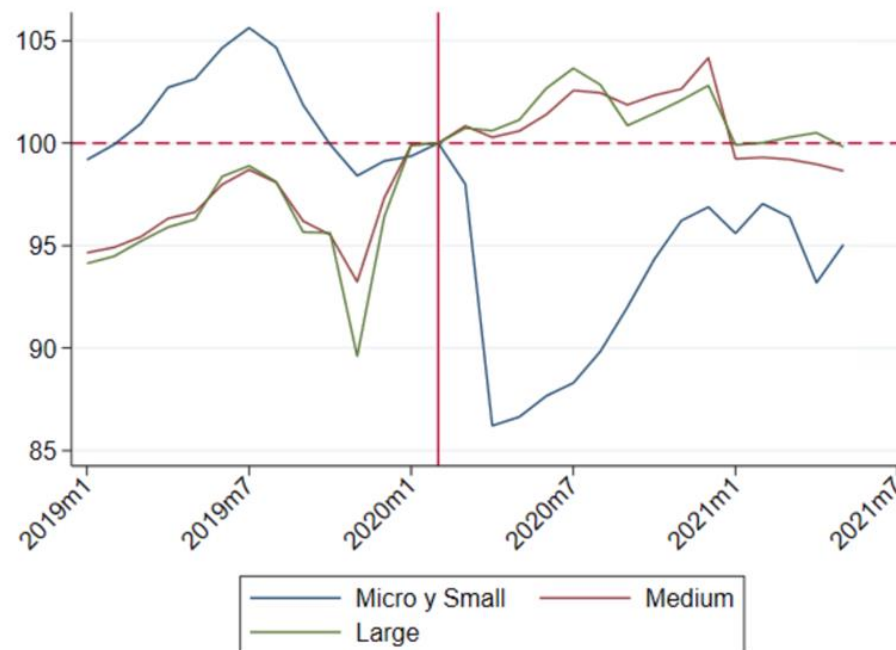
# Appendix

# Output Market: Extensive Margin Heterogeneity

Number of firms – by sector \*



Number of firms – by size \*\*

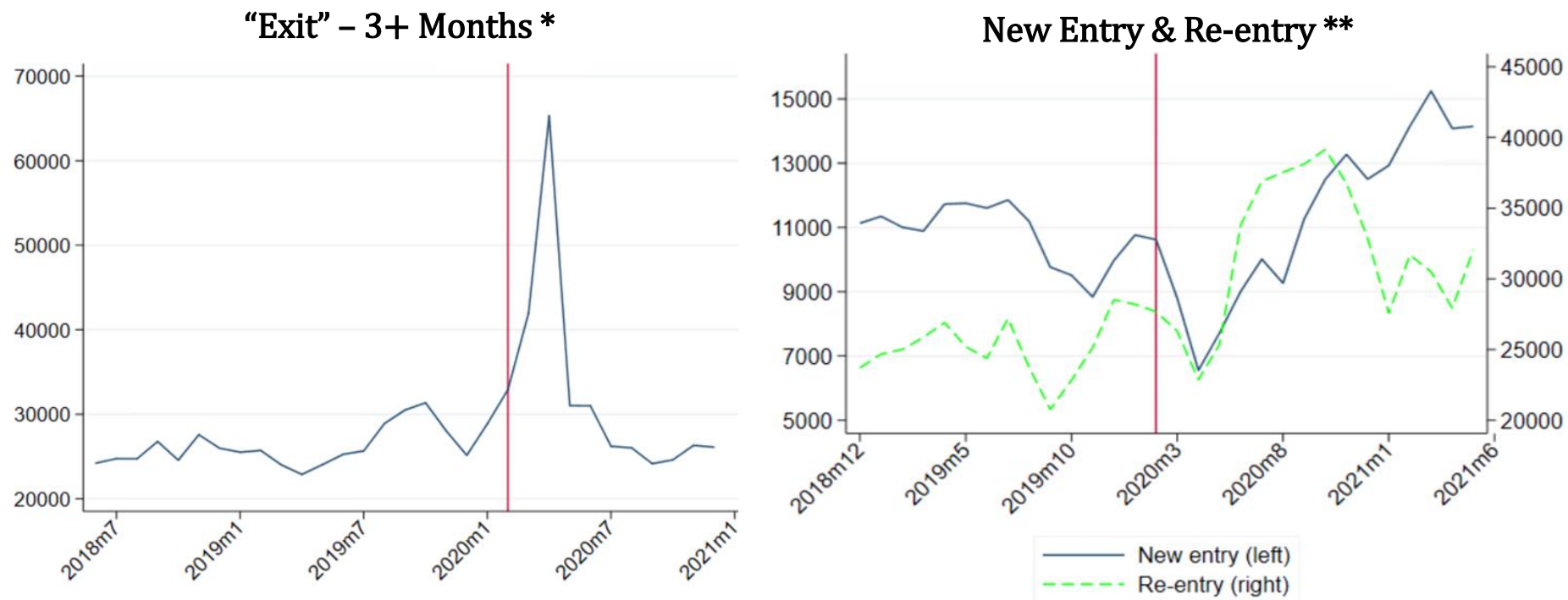


Note: (\*) Displaying only 4 aggregate sectors of 15 in total; (\*\*) Size defined as per yearly sales of previous year as follows: Micro&Small less than USD960.000 per year; Median: less than USD3.8M per year; Large: more than USD3.8M per year.

- **Heterogeneity in sectors:** Manufacturing and Commerce have led the recovery, while others continue to lag (e.g. services and restaurants/hotels)
- **Heterogeneity in size:** All firms that exited were micro & small, unlike in the Social Unrest episode



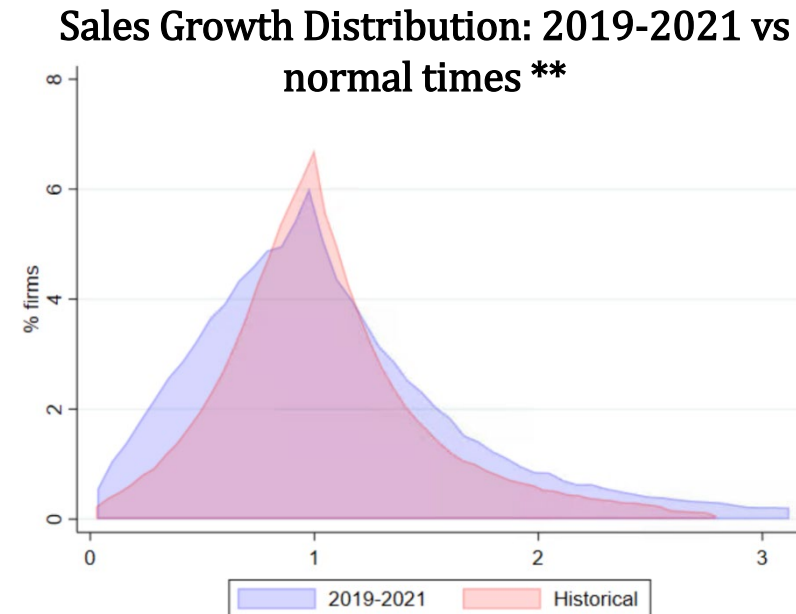
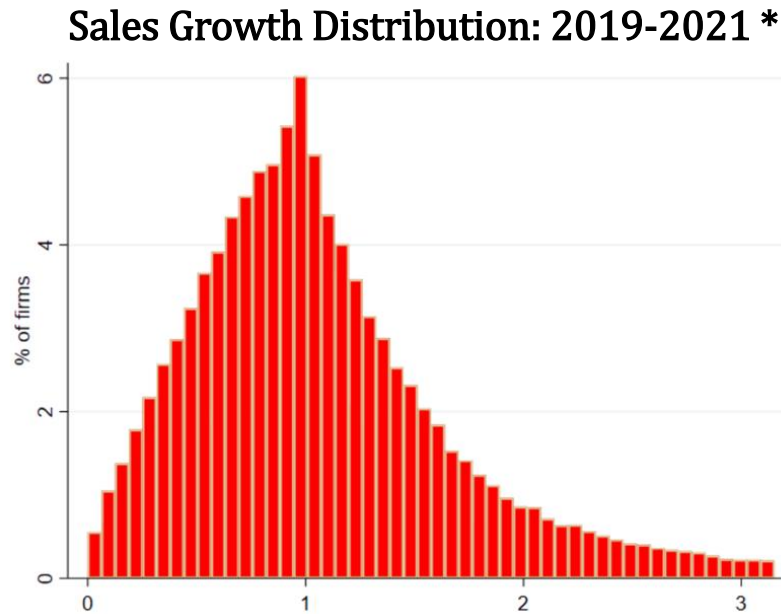
# Output Market: Entry & Exit



Note: Exit is computed as firms that do not report sales in F29 for 3 or more consecutive months; (\*\*) Entry is computed as newly entrant firms (i.e. firms with a never seen before tax ID), and re-entry are firms that were classified as Exit that post sales afterwards. Source: Monthly tax form F29.

- **Firm exit peaked in April**, with close to 70k firms (~10%)
- **Reentry of firms** soon after that became an **important force** with a peak of 40k firms in 09/2020
- **Newly entrant firms** had a trough in april/2020, and then quickly recovered to exhibit record numbers

# Output Market: Heterogeneity in Sales Across Firms

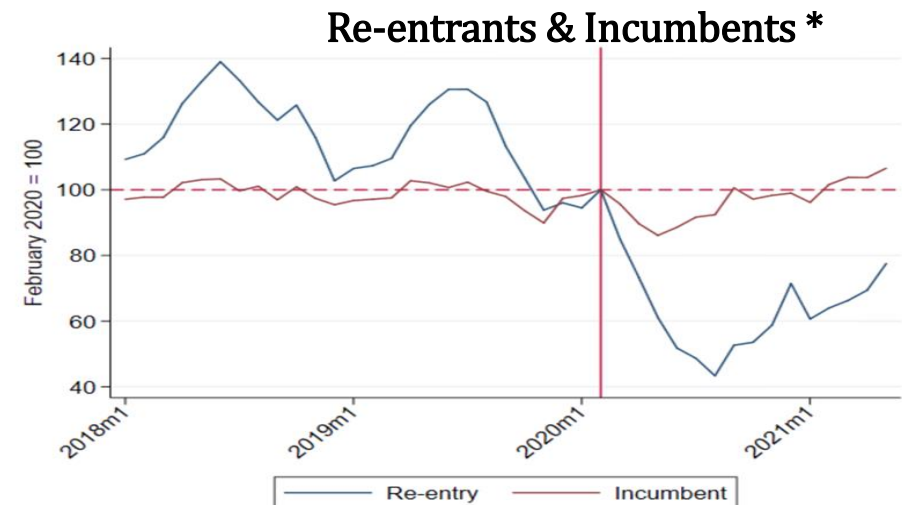
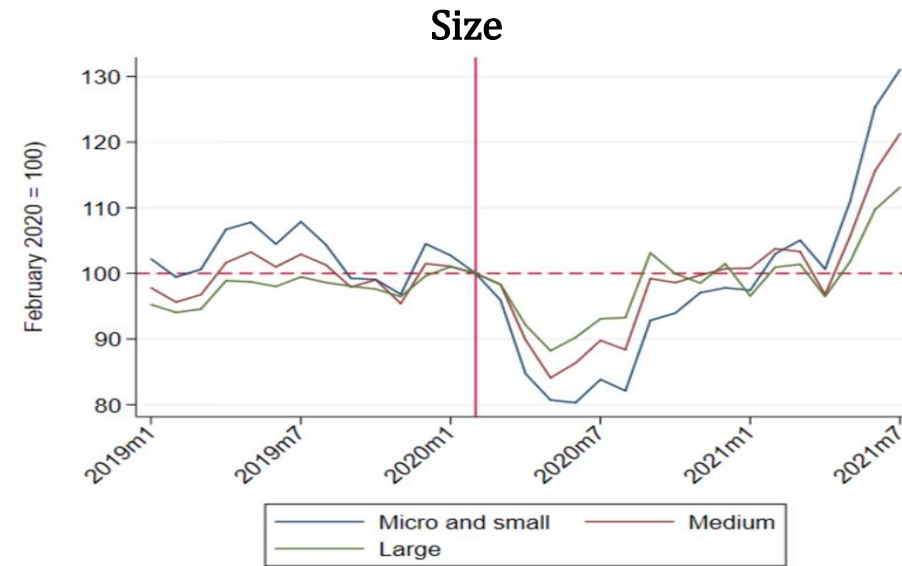
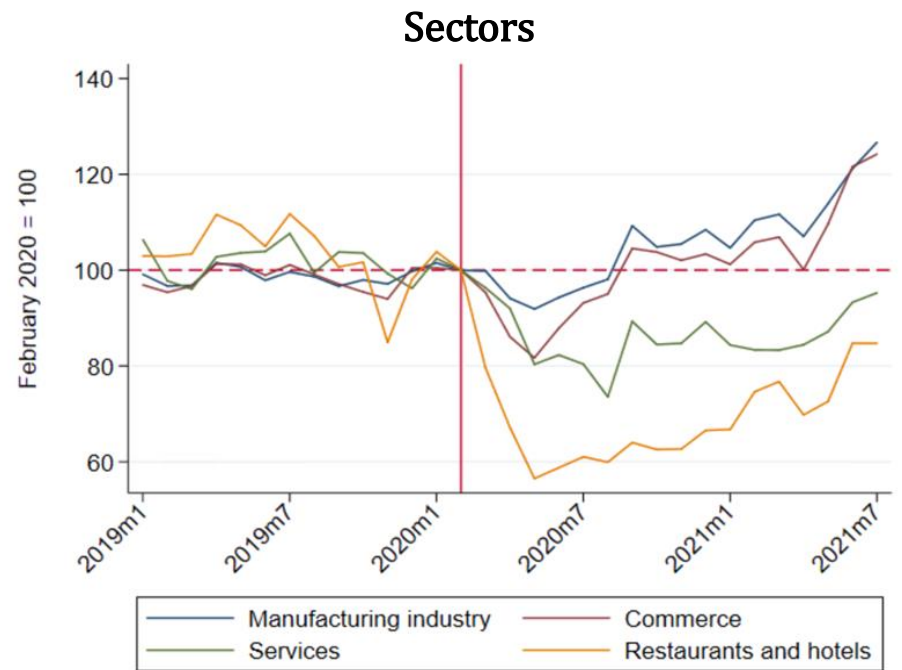


Note: (\*) Distribution refers to the ratio of sales for March-May 2021 vs March-May 2019. (\*\*) The historical distribution is the average of the distribution of the ratio of sales in March-May for three pairs of years: 2018-2020, 2017-2019, and 2016-2018. Source: Monthly tax form F29.

- Left panel: For each firm, we compute the ratio of average real sales in March-May 2021 with respect to March-May 2019 and plot the distribution
- Right panel: We compare this distribution with the distribution of this ratio for “more normal” two-year periods: 2016-2018, 2017-2019, and 2018-2020
  - An average of these three distributions shows the recovery from the COVID shock features more heterogeneity across firms than normal times

# Output Market: Sales Heterogeneity

- **Heterogeneity in sectors:** manufacturing and commerce leading here too.
- **Heterogeneity in size:** Micro&Small falling harder and recovering most
- **Heterogeneity in Entrants:** Micro&Small falling harder and recovering most

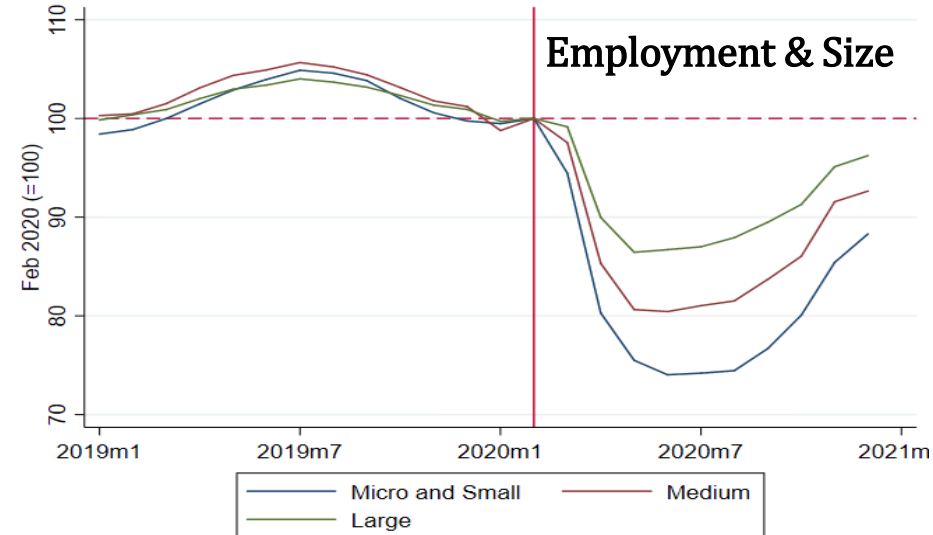
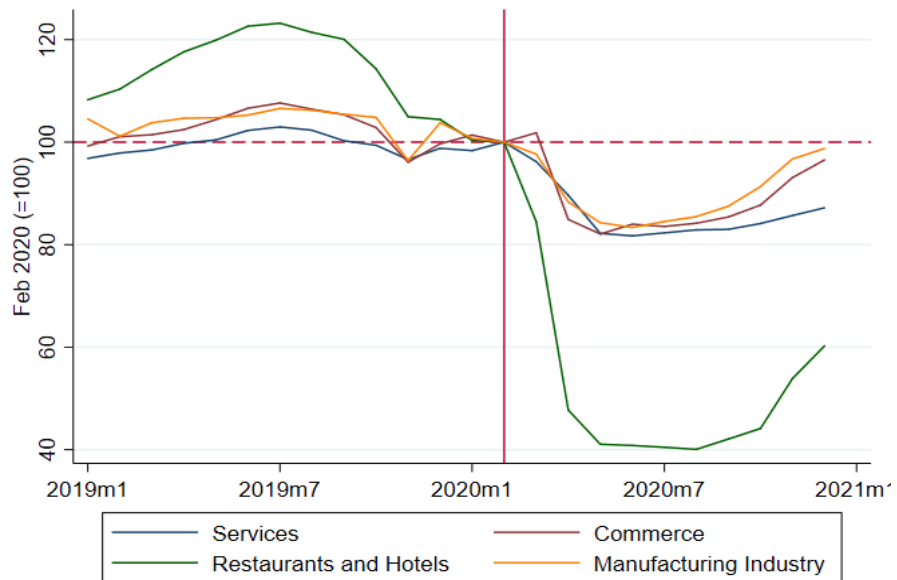


Note: (\*) Re-entrants: those that existed post 2020.M2 for 3+ consecutive months. Source: Monthly tax form F29 and Electronic Invoice .

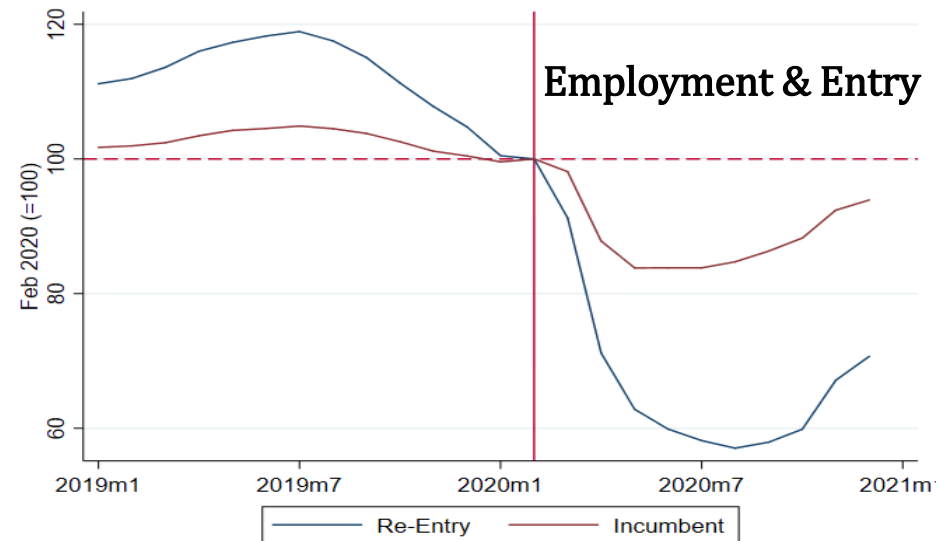
# Labor Market Extensive Margin: Heterogeneity

- **Employment has lagged less in more active sectors** (industry and commerce) but has fallen in others
- It has **lagged across all firms' size**
- Has **lagged much more in re-entrants**

Employment & Sector



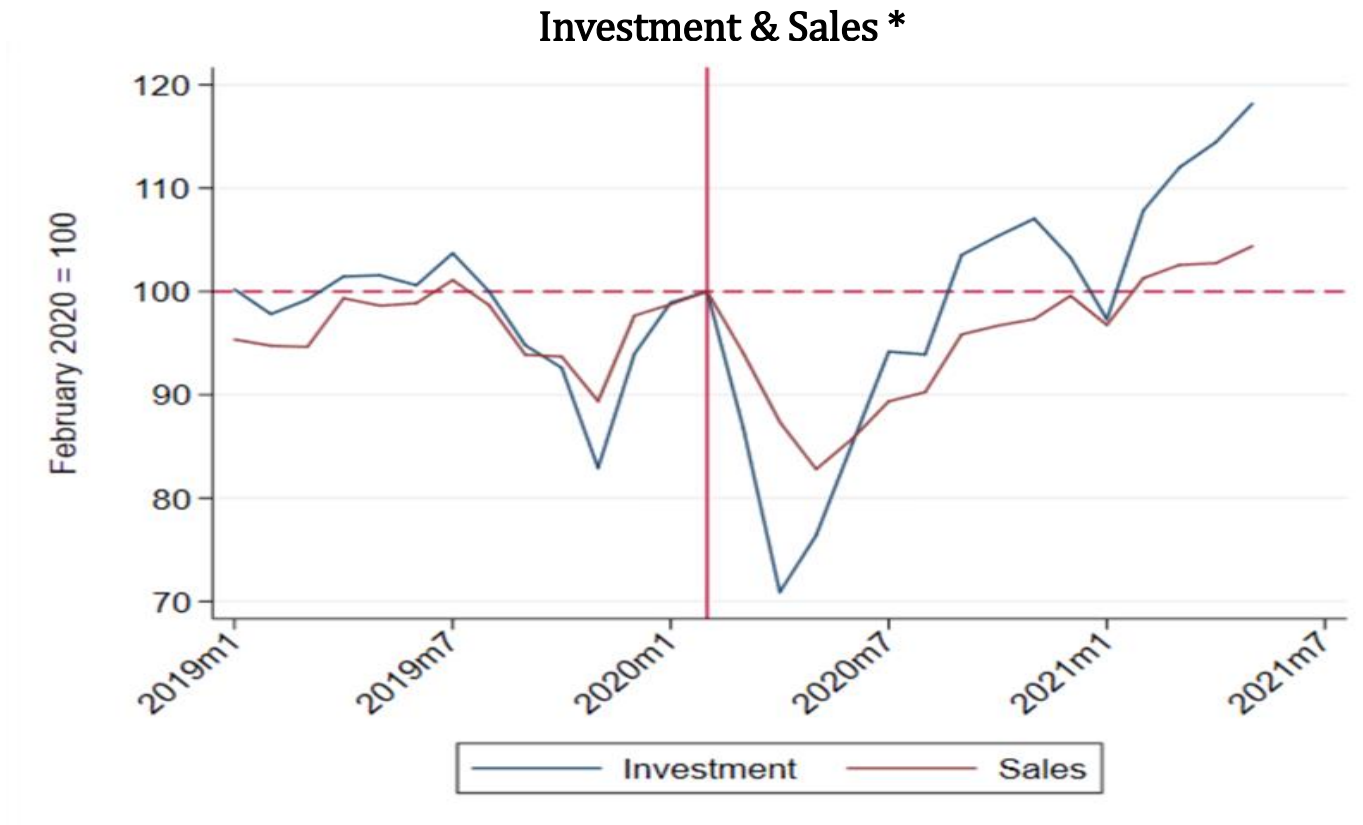
Employment & Size



Employment & Entry

Note: Source: Monthly tax form F29 and Electronic Invoice .

# Physical Capital Market: Investment



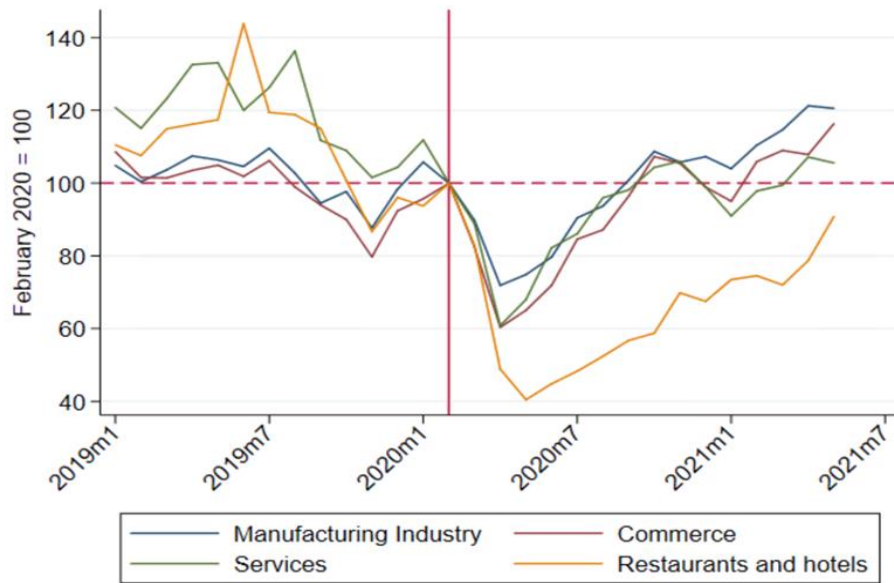
Note: (\*) Investment in Machinery & Eq. Source: Tax form F29.

- Machinery & Equipment **investment fell harder and faster** than sales, with a trough in April 2020 of about 70% that in February 2020
- There has been a **strong recovery** as well, with a level close to 20% that of pre-pandemia
- Recovery across size and sectors, except for restaurants and hotels

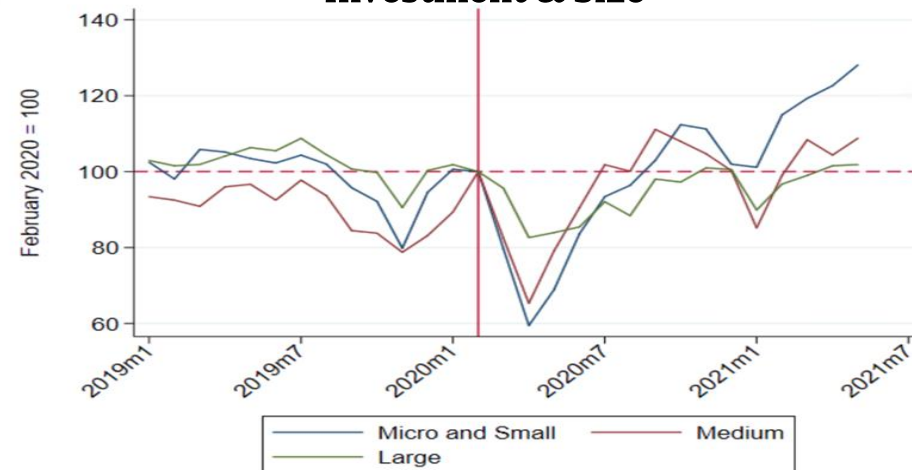
# Physical Capital Market: Heterogeneity

- Investment is recovering in all sectors, even those that are still lagging in sales
- This is robust to size and re-entrants/incumbents

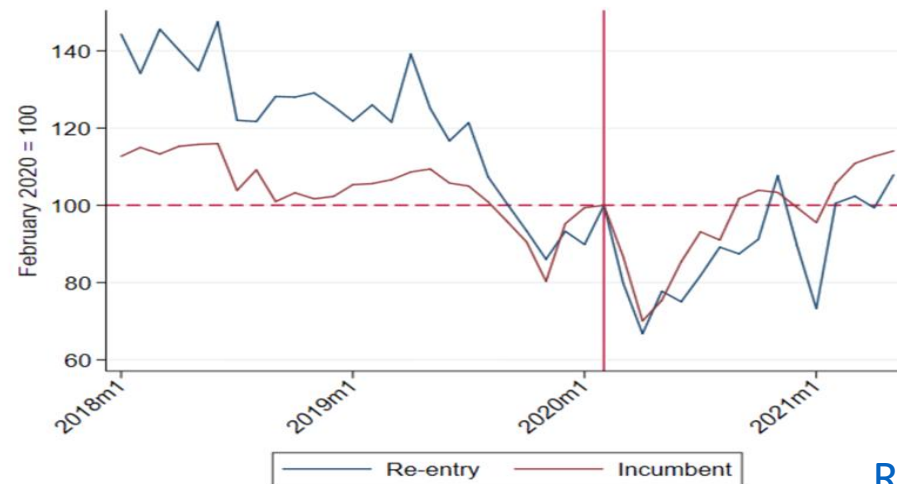
Investment & Sector \*\*



Investment & Size \*



Investment & Entry \*\*\*

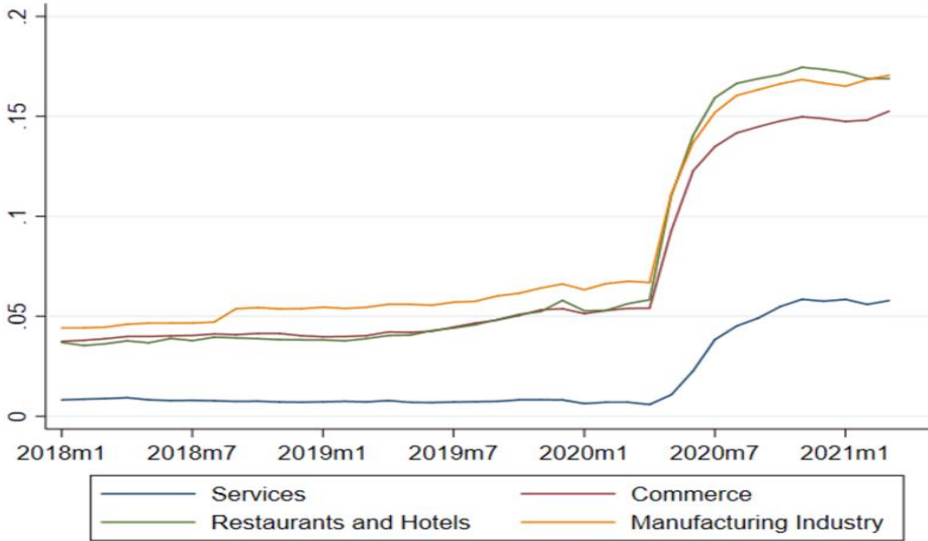


Note: (\*) Investment in Machinery & Eq. Source: Tax form F29.

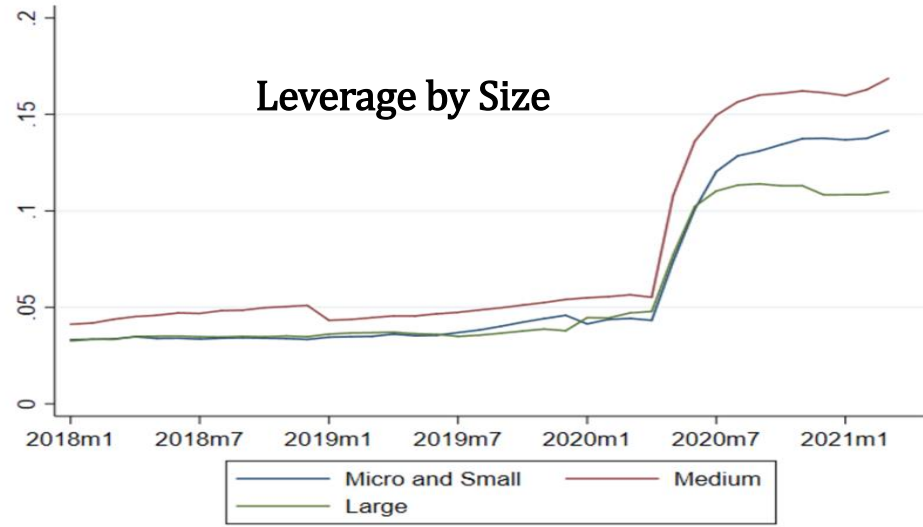
# Credit Market and Leverage: Heterogeneity

- Leverage nearly tripled **across all sectors**, even those with low historical levels of leverage
- It increased **across all sizes**, though slightly more on médium and small firms
- It increased relatively **more on incumbent firms**

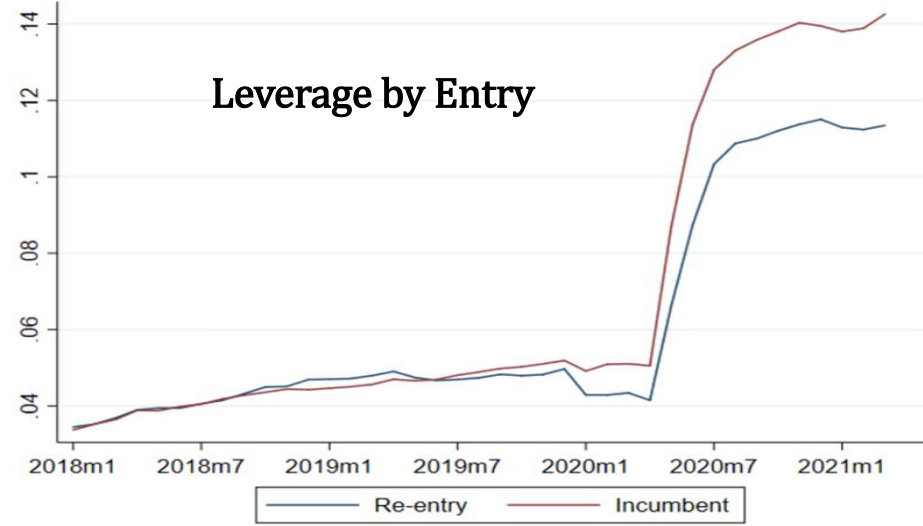
Leverage by Sector \*



Leverage by Size



Leverage by Entry

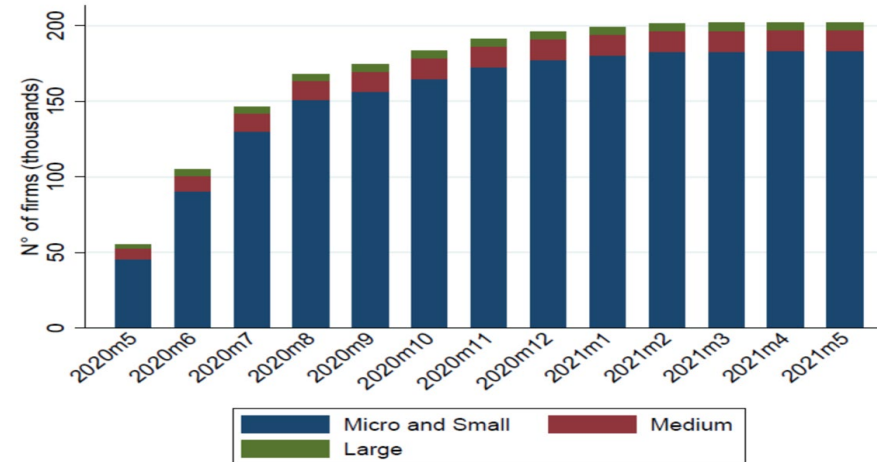


Note: (\*) Ratio of debt to yearly sales (between 2018.Q3 to 2019.Q3) Source: Financial Regulator Commission and tax form F29.

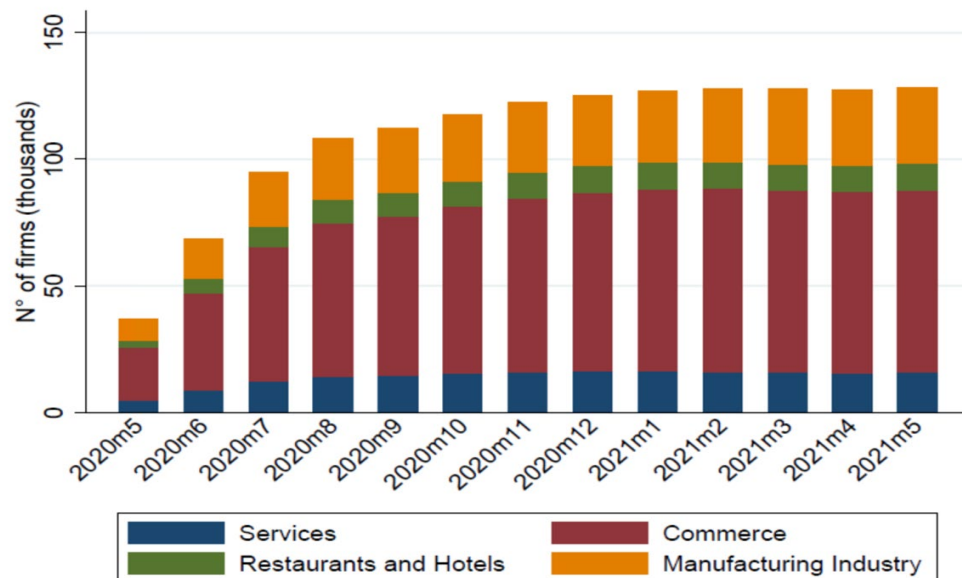
# Public Credit Guarantee: Heterogeneity

- Flows of FOGAPE loans were directed more to **commerce and manufacturing**
- They were **evenly distributed across sizes**
- They were **overwhelmingly given to incumbent firms**

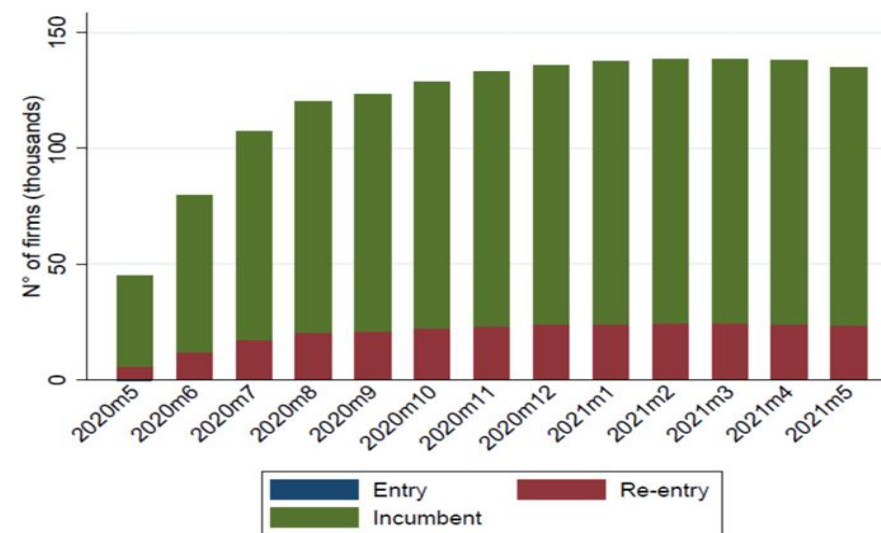
No. of Firms with Fogape - Size



No. of Firms with FOGAPE - Sector\*



No. of Firms with Fogape - Entry \*\*

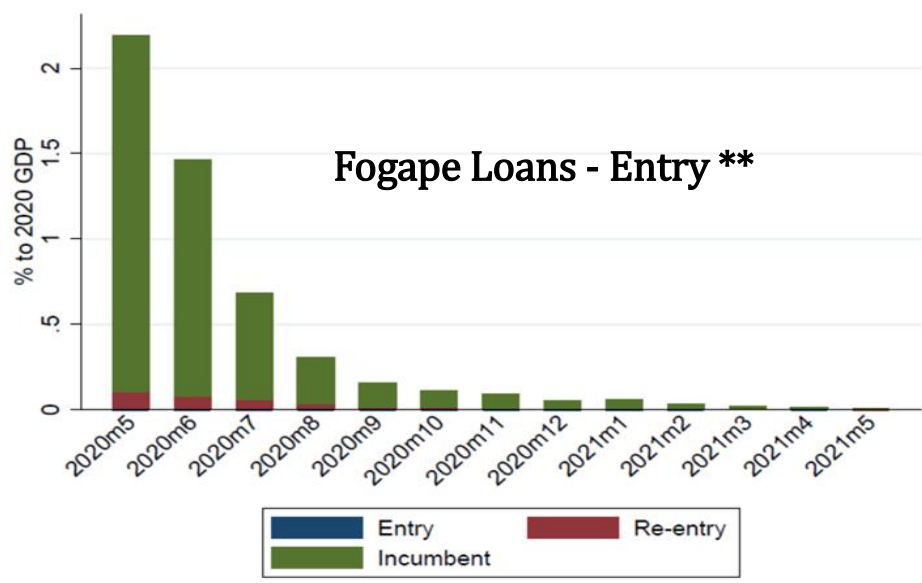
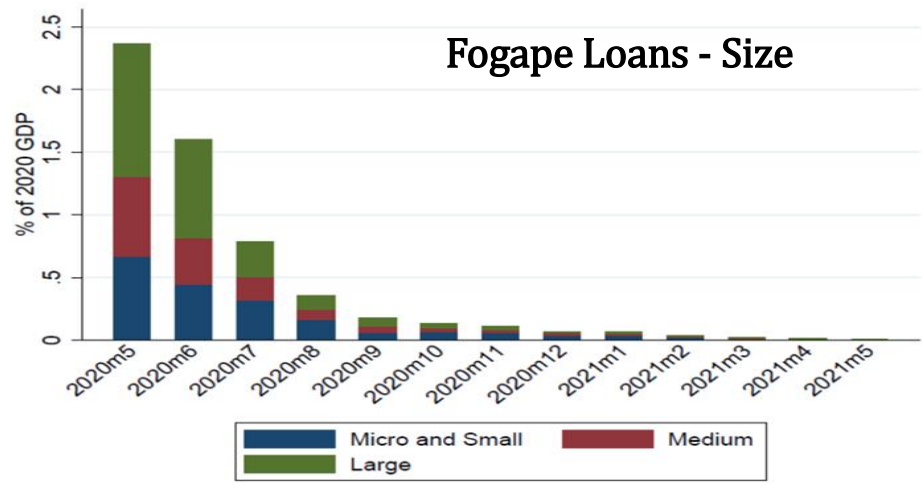
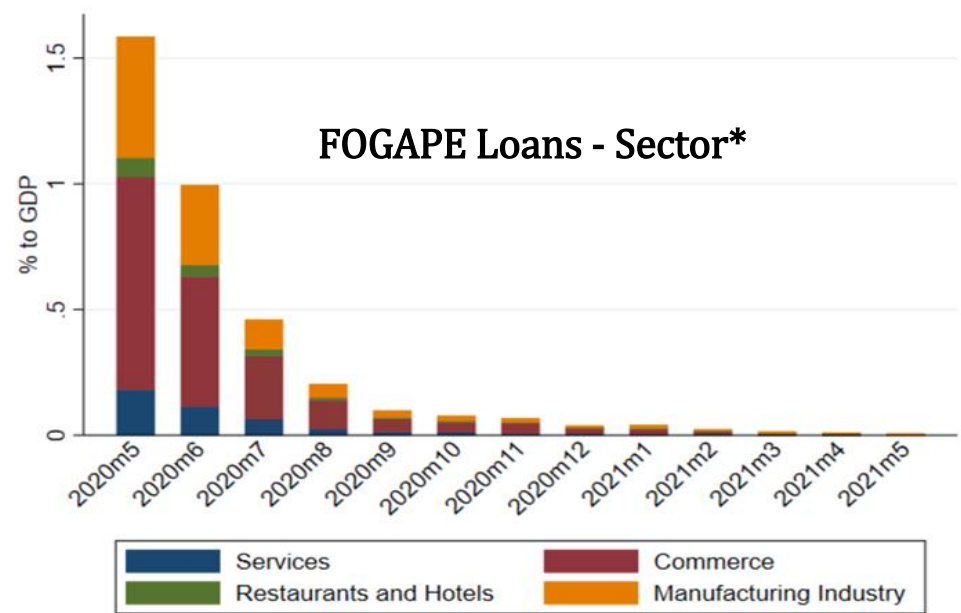


Note: (\*) Firms that at a given month had gotten a FOGAPE loan; Source: Financial Regulator Commission and tax form F29.



# Public Credit Guarantee: Heterogeneity

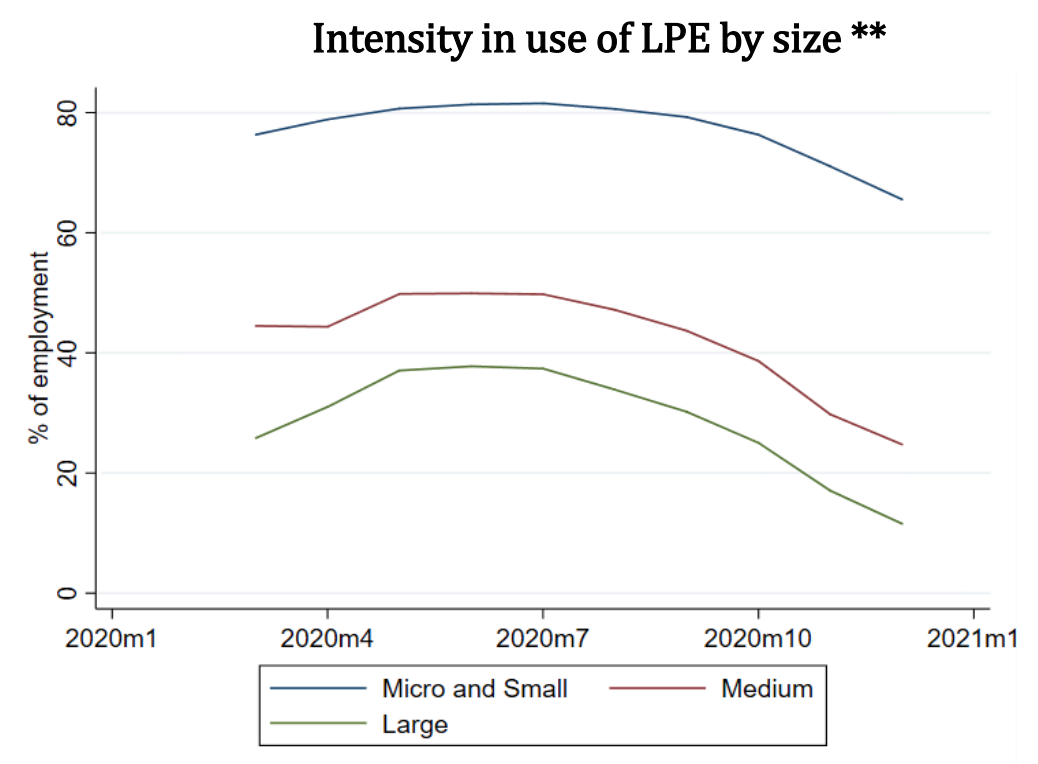
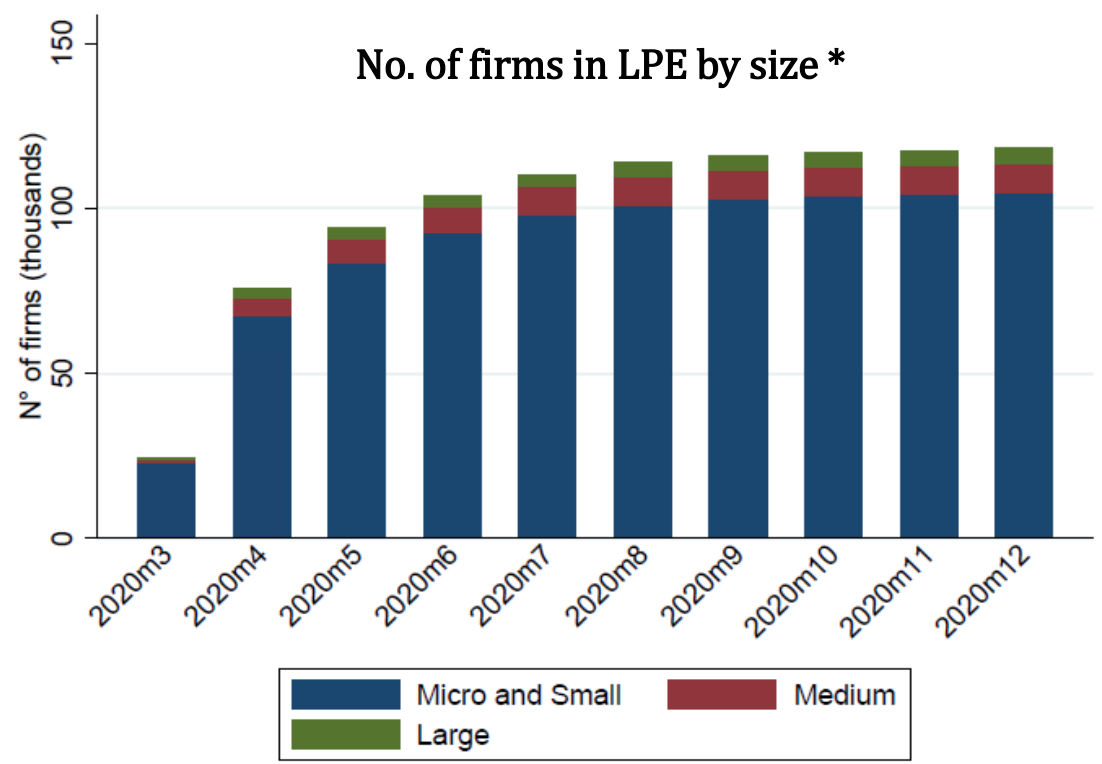
- Firms in manufacturing & industry accessed relatively more
- Mostly Micro & Small firms, and also incumbent



Note: (\*) Firms that at a given month had gotten a FOGAPE loan; Source: Financial Regulator Commission and tax form F29.

# Employment Protection: Heterogeneity

- Access to LPE has been largely concentrated in micro and small firms.
- Among micro and small firms that accessed LPE, between 60–80% of the payroll was enrolled.

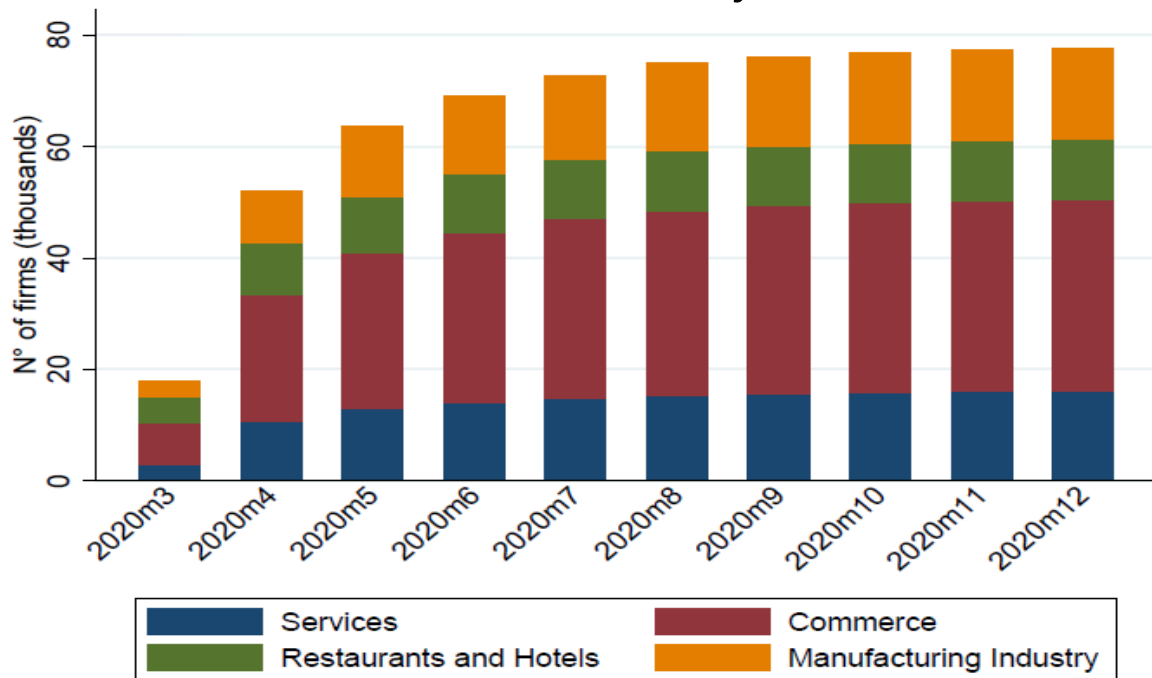


Note: (\*) Cumulative number of firms with at least one worker enrolled in LPE. (\*\*) Percent of payroll under LPE among firms that accessed the policy. Source: Employer-employee dataset, and employment protection program (LPE) dataset.

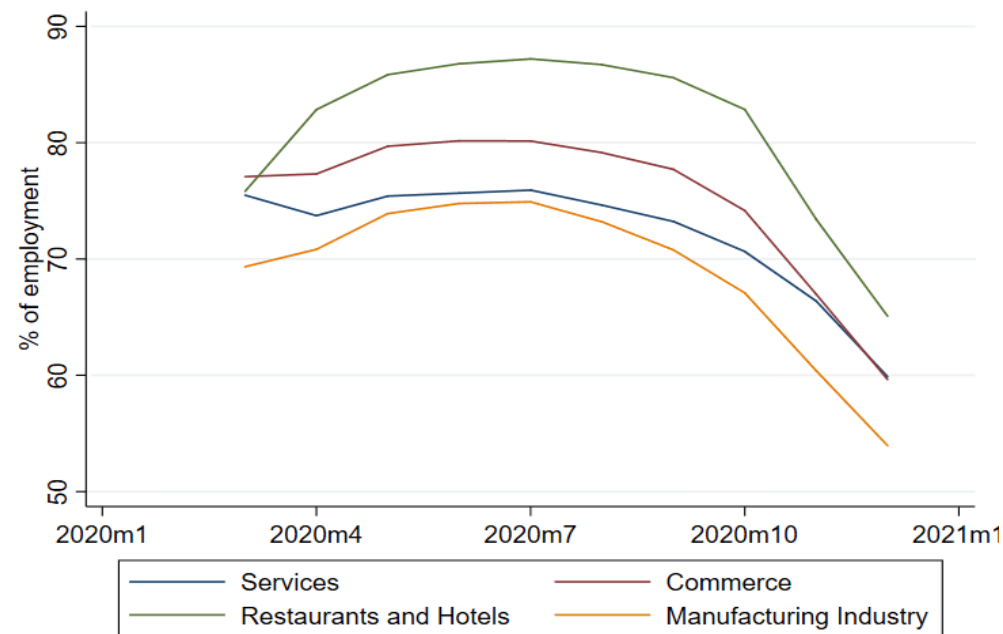
# Employment Protection: Heterogeneity

- Access to LPE has been largely concentrated in commerce and manufacturing firms.
- Among the firms that accessed LPE, those in the restaurants and hotels sector enrolled a larger fraction of their payroll.

No. of firms in LPE by sector \*



Intensity in use of LPE by sector \*\*

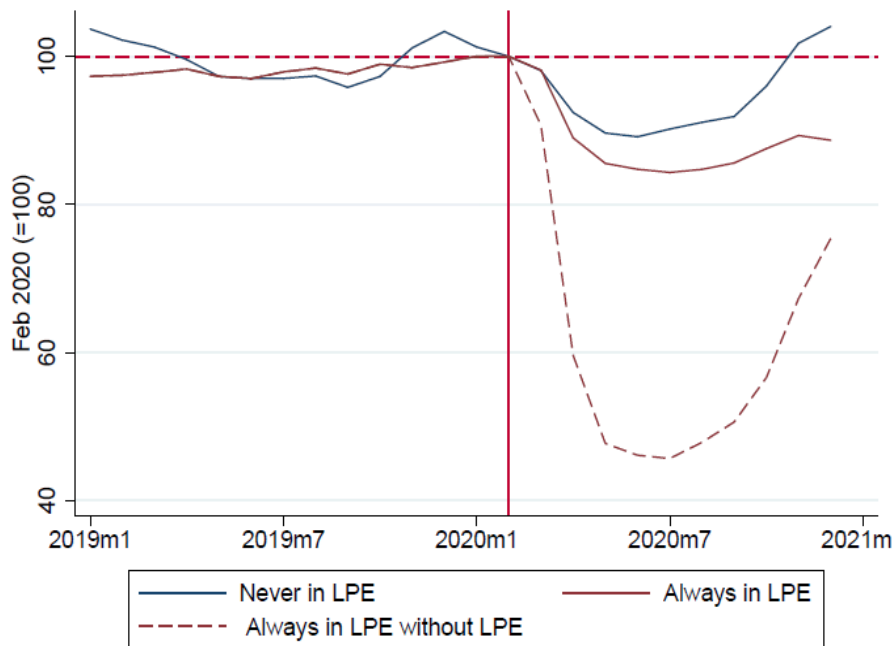


Note: (\*) Cumulative number of firms with at least one worker enrolled in LPE. (\*\*) Percent of payroll under LPE among firms that accessed the policy. Source: Employer-employee dataset, and employment protection program (LPE) dataset.

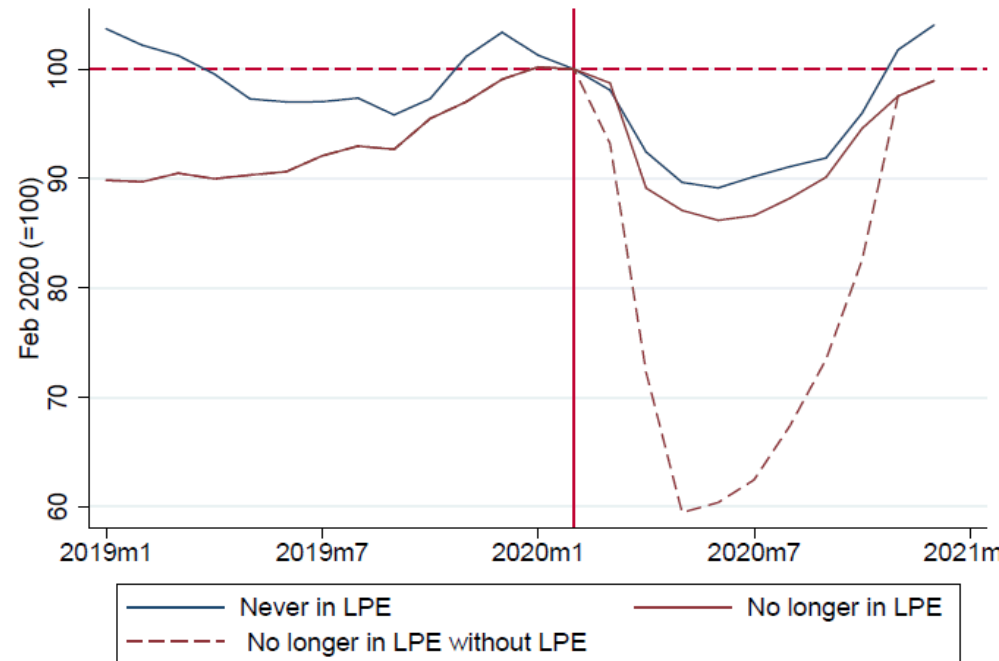
# Employment Protection: Performance

- Among firms that accessed LPE at the start of the crisis (Mar–May 2020):
  - Employment in firms that never left policy support (left panel) have seen a slower recovery than that of firms that had left policy support by November at the latest (right panel).

**Employment: Firms that accessed LPE in Mar-May 2020 and stayed at least until Dec \***



**Employment: Firms that accessed LPE in Mar-May 2020 and had left LPE by Nov \*\***



Note: (\*) Solid and dashed red lines refer to firms that enrolled workers in March, April or May 2020 and had at least one worker enrolled each month until December. (\*\*) Solid and dashed red lines refer to firms that enrolled workers in March, April or May 2020 and had no workers enrolled by November, at the latest; and have positive sales in Nov and Dec. Not seasonally adjusted. Source: Employer-employee dataset.

# Employment Protection: Performance

- Among workers that enrolled in LPE at the start of the crisis (March–May):
  - By December, more than 75% were still with the firm they worked for at the time of enrollment in employment protection, with more than 50% back to work.
  - By December, about 24% had left LPE the firm they worked for at the time of enrollment (they must be unemployed, inactive, or working for another firm).

**Workers that enrolled in LPE in Mar-May:  
Status throughout 2020**

	2020						
	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Under LPE	94,13%	89,49%	82,12%	75,25%	65,15%	40,53%	23,47%
Back to work in the same firm	4,42%	7,09%	11,28%	15,83%	22,36%	41,07%	52,63%
Other	1,45%	3,42%	6,60%	8,92%	12,49%	18,40%	23,90%

Note: We track the status of workers that enrolled in LPE in March, April or May 2020 throughout the rest of the year. Under LPE: workers enrolled in LPE (with any firm). Back to work in the same firm: workers recalled to the firm they worked for in Mar-May. Other: workers that may be out of the labor force, unemployed, or working for a firm other than the one they were working for when they enrolled in LPE. Source: Employer-employee dataset.

# LPE & FOGAPE: Performance

- Among firms that accessed policy support in March–June 2020 (2nd row), 31% accessed LPE only, 41% accessed FOGAPE only, and 28% accessed both LPE and FOGAPE
- For each of these three sets of firms, we compute the median annual growth of sales at the start of the crisis (Mar–Apr)
- Firms that suffered the **sharpest decline in sales growth** (nearly 50%) accessed **LPE only**; firms that were relatively less affected (16% decline in sales growth) accessed FOGAPE only. The median firm that accessed both programs experienced an initial decline of sales growth of about 39%
- In terms of sector, firms in commerce, and restaurants and hotels suffered substantial declines in sales growth

**Firm access to LPE and FOGAPE policies**

	LPE only			FOGAPE only			LPE and FOGAPE		
	Number of firms	Share of firms	Median sales growth	Number of firms	Share of firms	Median sales growth	Number of firms	Share of firms	Median sales growth
2020	50566	25,6%	-45,4%	106324	53,9%	-17,6%	40552	20,5%	-37,8%
Mar-Jun 2020	42488	30,9%	-49,2%	56290	40,9%	-16,3%	38723	28,2%	-38,9%
Micro and Small	38435	32,1%	-52,0%	49560	41,4%	-21,0%	31709	26,5%	-45,0%
Medium	2531	20,4%	-23,6%	4962	39,9%	9,1%	4933	39,7%	-16,3%
Large	1522	28,3%	-14,5%	1767	32,9%	9,7%	2081	38,8%	-12,7%
Services	6373	42,4%	-44,5%	4308	28,6%	-24,6%	4366	29,0%	-35,6%
Commerce	14163	27,4%	-51,8%	23769	46,0%	-14,8%	13710	26,5%	-40,4%
RRHH	4967	42,4%	-68,3%	2280	19,5%	-56,5%	4469	38,1%	-67,9%
Manufacturing	5486	28,2%	-39,6%	7682	39,5%	-15,3%	6303	32,4%	-31,0%

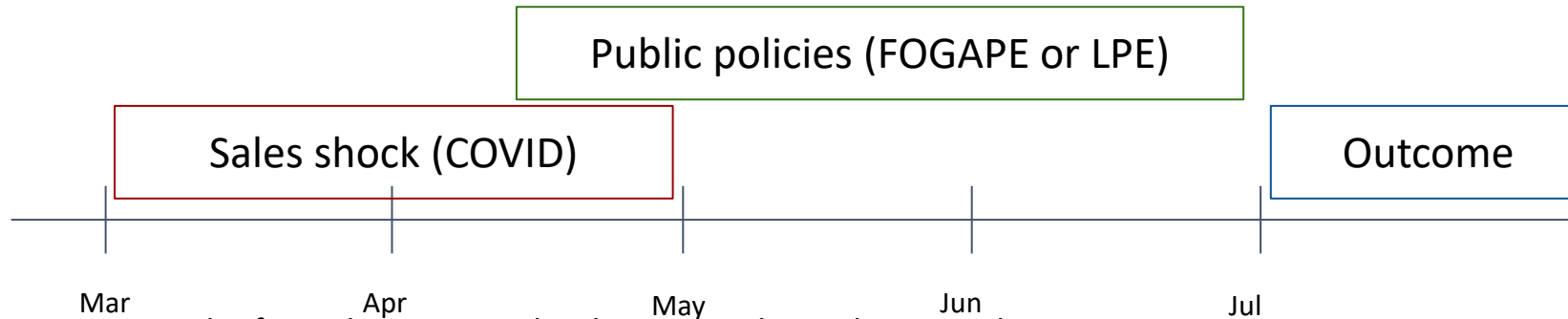
Note: To compute median sales growth in Mar-Apr of each set of firms, we begin by computing, for each firm, average annual sales growth in March-April; we then compute the median across firms. Source: Electronic Invoice, employer-employee dataset, employment protection law (LPE) dataset, Financial Regulator Commission, and FOGAPE credits dataset.

# Variables in Probit & OLS Regressions

- Extensive margin - dependent variables
  - **No report**
    - Report no sales or null sales for the first time starting in July 2020.
  - **Reentry**
    - Over a subset of firms, which reported no sales for the three months of Apr-Jun 2020, we determine if a firm reenters.
      - Reentry dummy equals 1 if a firm in this group reports positive sales in July 2020.
- Intensive margin - dependent variables
  - **Employment**: annual growth of total employment reported by the firm (includes LPE)
  - **Investment** annual growth is the difference in the flow of investment in July 2020 relative to that in July 2019 divided by historical sales.
    - Historical sales is the average of sales over Oct 2018 though Sept 2019, times 12.
- Two explanatory variables related to **credit**
  - Credit intensity: Change in the stock of domestic bank debt between the end of February 2020 and June 2020, scaled by historical sales
  - Dummy variable that takes the value of 1 if the firm accessed to FOGAPE loans during April, May or June 2020.
- Two explanatory variables related to the **employment protection program (LPE)**
  - Ratio of workers enrolled in LPE as a share of a firm's total employment.
    - Numerator: Total number of workers enrolled in LPE during March, April, May and June 2020.
    - Denominator: Total number of workers during March, April, May and June 2020.
  - Dummy variable that takes the value of 1 if the firm accessed to LPE during March, April, May or June 2020
    - To be considered in LPE, firms must report at least one worker under LPE for at least one of the months stated above

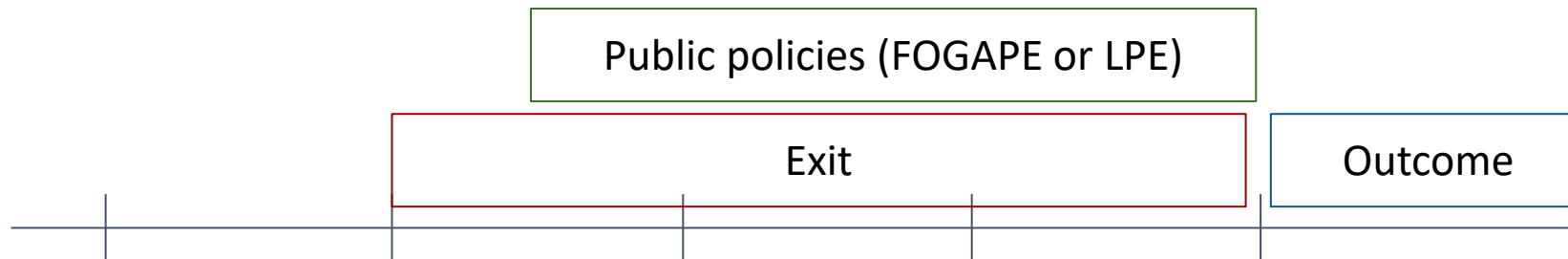
# Effects of policy support – Timing identification

- Regressions where outcome is “No report” or employment and investment growth



- We consider firms that report sales during March, April, May and June 2020.
- In July, we evaluate if the firm reports no sales (No Report = 1) or sales (No Report = 0)
- In July, we evaluate annual growth of total employment and investment

- Regressions where outcome is “Re-Entry”



- We consider firms that report no sales during April, May and June 2020.
- In July, we evaluate if the firm reports positive sales (reentry is 1) or no sales (reentry is 0).



# Effects of policy support – sample of firms

## Sample of firms considered for regressions

- We consider all firms that have at least one month of positive sales since January 2018.
- Exclude firms without information of sector or firm size.
- Exclude firms in the following sectors: utilities, agriculture, and public administration.
- Restrictions on sales:
  1. Keep firms with positive sales in March and/or April 2019 (to compute annual growths)
  2. Keep firms with positive sales in any of the following months: Dec 19', Jan 20' or Feb 20' (to include firms that did not exit following the riots of Oct./Nov. 2019)
  3. Exclude firms with global exits prior to March 2020 (to study exit only related to COVID)
  4. Keep firms with at least one month of positive sales since February 2020.
- Winsorize debt growth at 5% and 95%, and employment growth at 99%.
- In the regressions where outcome is “No report” or employment and investment growth, we show results for firms that experienced negative average annual sales growth in March and April 2020 (about two thirds of total firms)

# Effects of policy support – sample of firms

Data for analysis

Filter	Number of firms	Negative sales growth
None	1.269.737	
Sector and firm size	838.394	
Restriction (1)	616.085	
Restriction (1) y (2)	544.089	
Restriction (1), (2) y (3)	529.159	
<b>Restriction (1), (2), (3) and (4)</b>	<b>529.159</b>	<b>354.746 (67%)</b>
Restrictions (1), (2), (3) and (4) + Have at least one employee	285.099	183.955 (65%)

- Regressions where outcome is “No report”, investment growth and “Re-entry” Restrictions (1) – (4) apply.
- Regressions where outcome is employment growth Restrictions (1) – (4) + at least 1 employee apply.

# Effects of policy support – Descriptive Stats

**No report (July)**

	0	1	Total
No. of firms	497.557	31.602	529.159
Percentage	94,03%	5,97%	100%

**Reentry (July)**

		0	1	Sub -total	Do not exit	Total
Reentry	Number of firms	68.392	8.305	76.697	452.462	529.159
	Percentage	12,92% (89,17%)	1,57% (10,83%)	14,49% (100%)	85,51%	100%

**Total Employment  
Annual Growth**

Nº firms	224.383
Average	-0,12
Median	0
Std Dev	0,55

**Change in debt stock**

Nº firms	529.159
Average	0,02
Median	0
Std Dev	0,05

**Access to FOGAPE**

	0	1	Total
Number of firms	385.665	143.494	529.159
Percentage	72,88%	27,12%	100%

**Access to LPE**

	0	1	Total
Number of firms	208.042	77.057	285.099
Percentage	72,97%	27,03%	100%

**Ratio LPE**

Nº firms	226.099
Average	0,18
Median	0
Std Dev	0,30