

Loan guarantees, bank lending and credit risk reallocation

Carlo Altavilla

European Central Bank

Andrew Ellul

Indiana University

Marco Pagano

University of Naples Federico II, EIEF

Andrea Polo

Luiss, UPF, BSE, EIEF

Thomas Vlassopoulos

European Central Bank

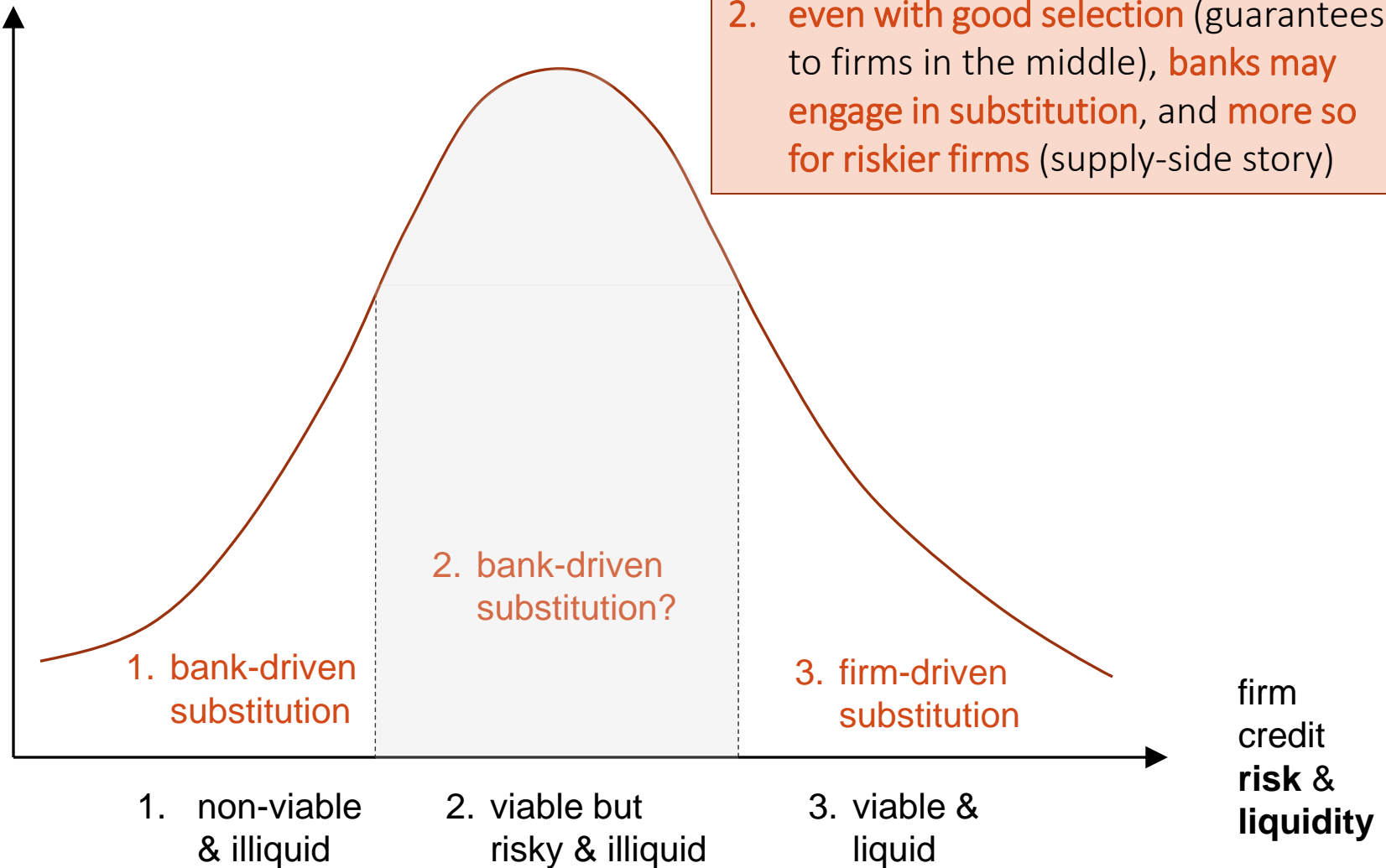
Bank of Italy-Bocconi University, 17-18 March 2022

The opinions in this presentation are those of the authors and do not necessarily reflect the views of the European Central Bank and the Eurosystem.

Loan guarantees: objectives and possible issues

- **Objective**: encourage lending by shifting default risk to the govt.
- Standard policy instrument, but used on a **massive scale in the COVID-19 crisis**: key fiscal policy plank in most countries
- **Why?** Provide **liquidity** to viable firms facing cash flow dry-up ⇒ avoid costly liquidations
- Policy **leakage?** Guarantees may not generate a commensurate increase in lending, as **banks** may **substitute** non-guaranteed with guaranteed loans:
 - “The main **danger** is the **transfer of pre-existing exposures**. A **bank** with an exposure to a firm **could ask** it to use the guaranteed debt to repay its existing loans” (Blanchard, Philippon & Pisani-Ferry, 2020)
- But in principle **firms** may **ask** for such **substitution** as well:
 - they may use guarantees to restructure debt and lower its **cost**
- So the issue of **substitution** is intertwined with that of **selection**, i.e., which firms have access to loan guarantees

Selection and substitution



Insights:

1. **bad selection** (guarantees to firms in the tails) \Rightarrow **more substitution**
2. **even with good selection** (guarantees to firms in the middle), **banks may engage in substitution**, and **more so for riskier firms** (supply-side story)

Policy makers are aware of these issues...

- The **Communication of the EU Commission** about State aid in the pandemic (2020/C 91 I/01) lays out these **eligibility guidelines**:
 1. “The guarantee may be granted to undertakings that were **not in difficulty ... on 31 December 2019**” ⇒ **exclude** firms in the **lower tail**
 2. “[...] **but that faced difficulties or entered in difficulty thereafter as a result of the COVID-19 outbreak**” ⇒ **exclude** firms in the **upper tail**
- National regulators tolerate at most a limited degree of substitution

... and the media are aware too

FT Collections **Greensill Capital**

Greensill Bank AG

Greensill used taxpayer loans to cut exposure to Sanjeev Gupta

Lender resorted to scheme after regulators warned about risky lending to steel group

Cynthia O'Murchu and **Sylvia Pfeifer** in London and **Olaf Storbeck** in Frankfurt

JULY 4 2021

la Repubblica **AFFARI&FINANZA**

01-MAR-2021

da pag. 1-20

folio 1 / 2

Superficie: 79 %

Dir. Resp.: Maurizio Molinari

www.datastampa.it

Tiratura: 0 - Diffusione: 0 - Lettori: 188000: da enti certificatori o autocertificati

Il credito

Lo scudo delle garanzie statali
copre le banche più delle imprese

ANDREA GRECO → pagina 20

Il credito

Lo scudo delle garanzie statali copre più le banche delle imprese

elDiario.es

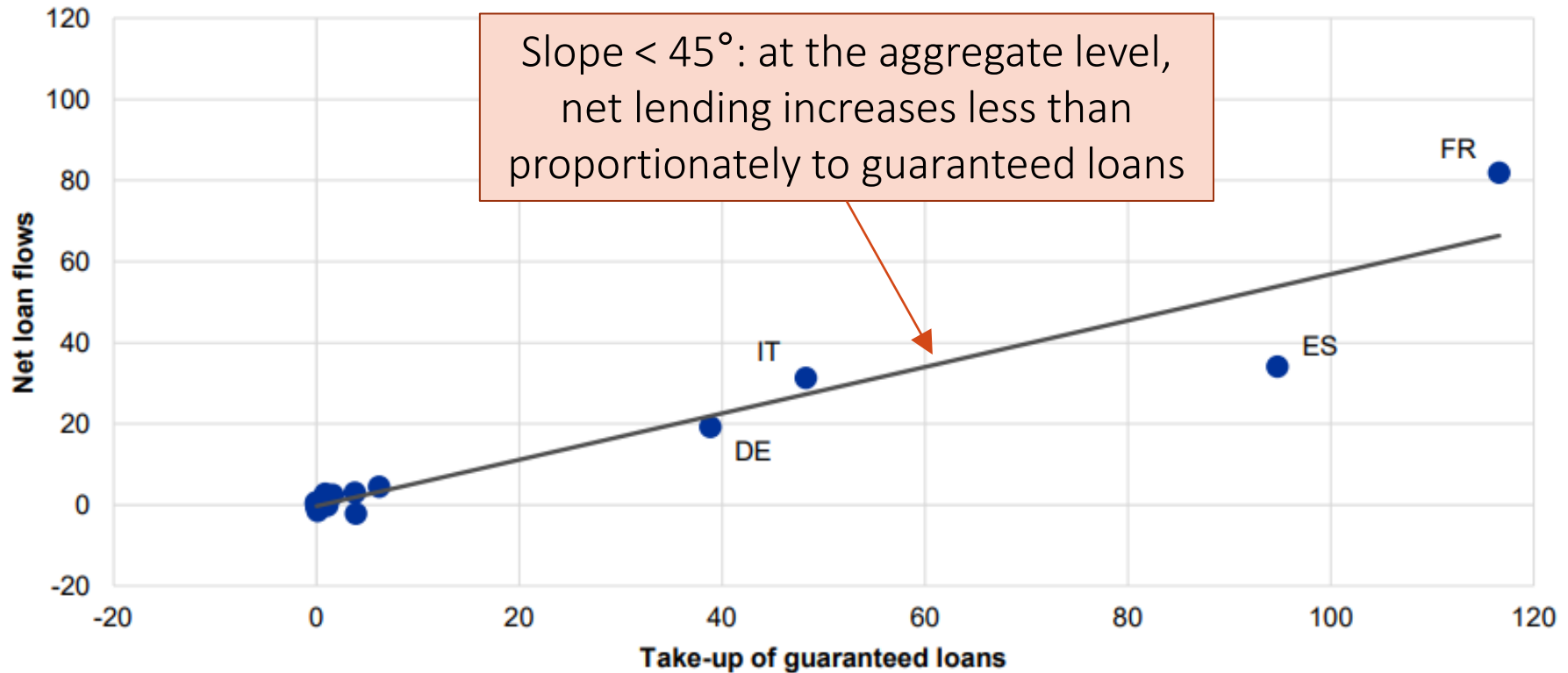
Marina Estévez Torreblanca

13 de mayo de 2020 - 22:46h  27

Una parte de los créditos avalados por el ICO para rescatar a las pymes se queda en manos de la banca para cubrir deudas de los empresarios

Las entidades utilizan los créditos concedidos con aval estatal para garantizar el pago de hipotecas o letras de créditos que previamente tuvieran suscritas la empresas, con lo que el dinero no llega a la economía real, una práctica permitida por el ICO

Guarantees and lending: aggregate public data



Source: *ECB Economic Bulletin*, Issue 6/2020



Contribution

||| This paper

- **We use bank-firm-level euro-area data** to investigate
 1. **selection**: which firms received loan guarantees and which banks provided them?
 2. **substitution for guarantee recipients**: how much reduction in the pre-existing loan exposure is observed? How does it vary across firms and banks characteristics?
 3. **cross-country consistency**: do the answers to questions 1 and 2 vary significantly across euro-area countries?
- **Novel data**: harmonized euro-area credit registry (Anacredit) matched with ECB supervisory bank-level data
- **Main identification strategy**: we compare lending to the same firm by banks that issue a guaranteed loan and by those that do not

Related research



Related research

➤ Pre-Covid-19 evidence on loan guarantees:

- Mostly positive effect in credit supply, employment and firm survival rates (Bachas et al., 2020; Schich et al., 2017; De Blasio et al., 2017; Ciani et al., 2020)

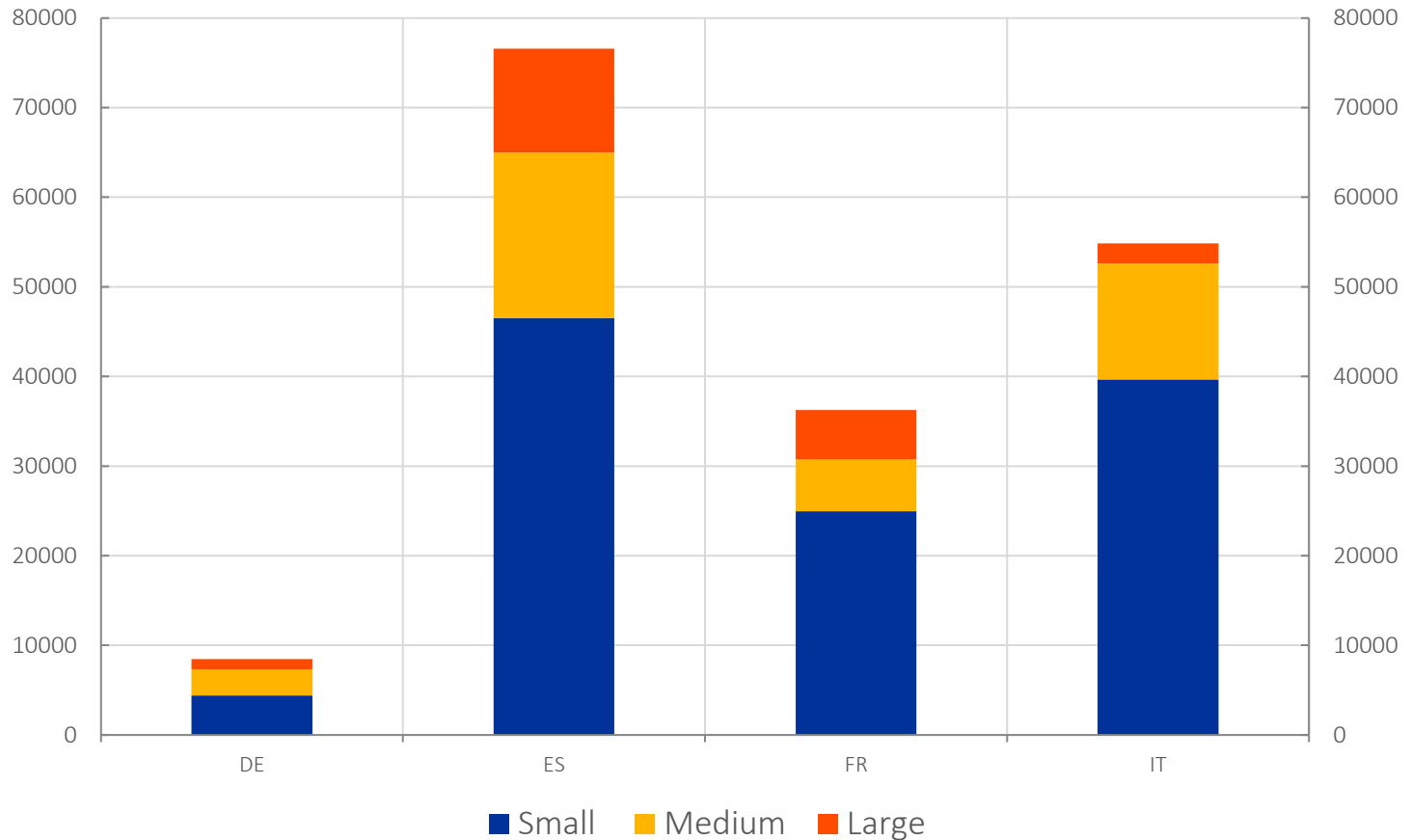
➤ Covid-19 evidence on loan guarantees:

- Allocation of guarantees (Granja et al., 2020; Chodorow Reich et al., 2020; Cororaton and Rosen, 2020, Core and De Marco, 2020; Kozeniauskas et al., 2020)
- Credit additionality (Cascarino et al., 2021)
- Real effects (Autor et al., 2020; Bartik et al., 2020)



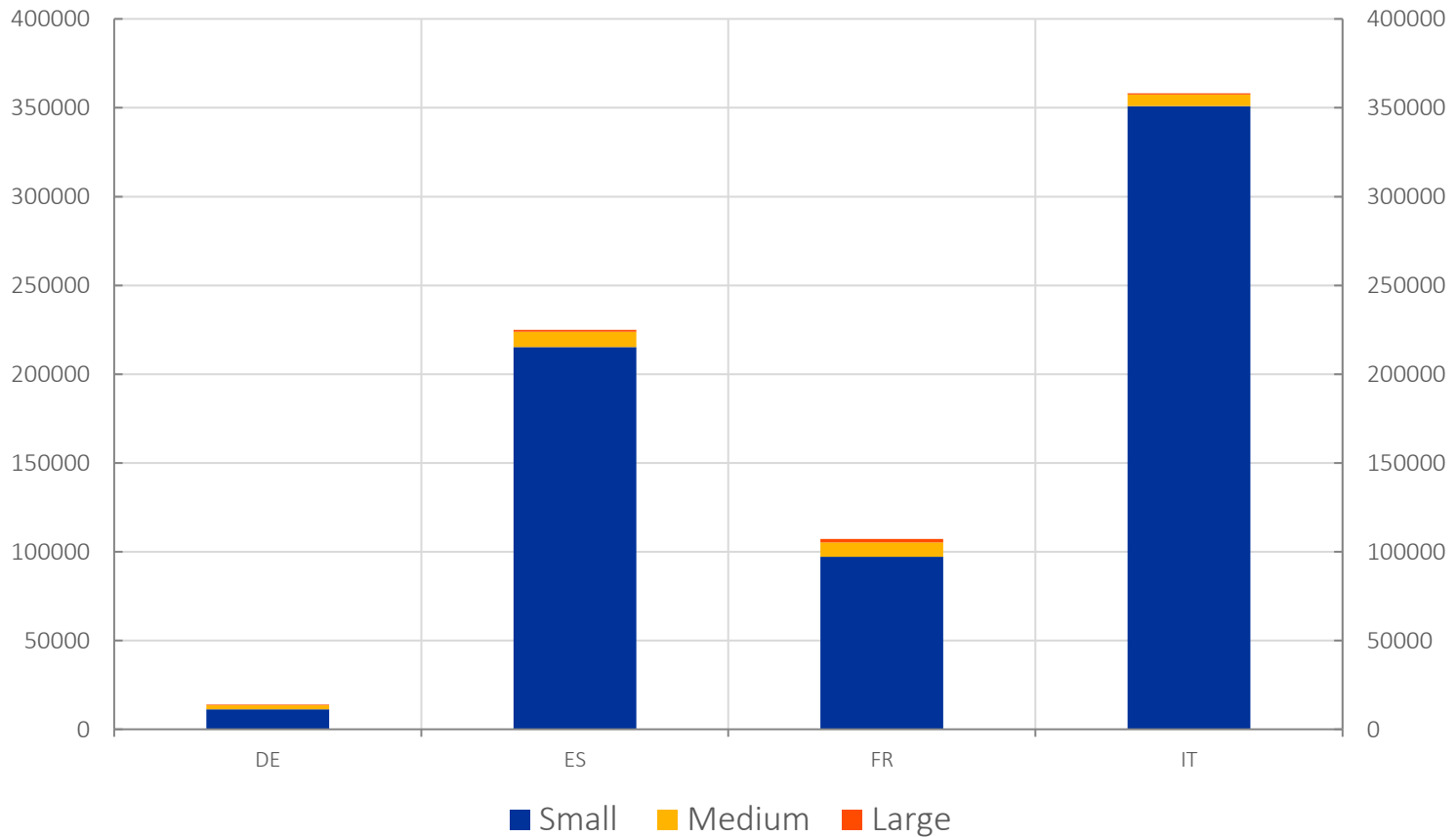
Data

Guaranteed loans by firm size (million Euro)



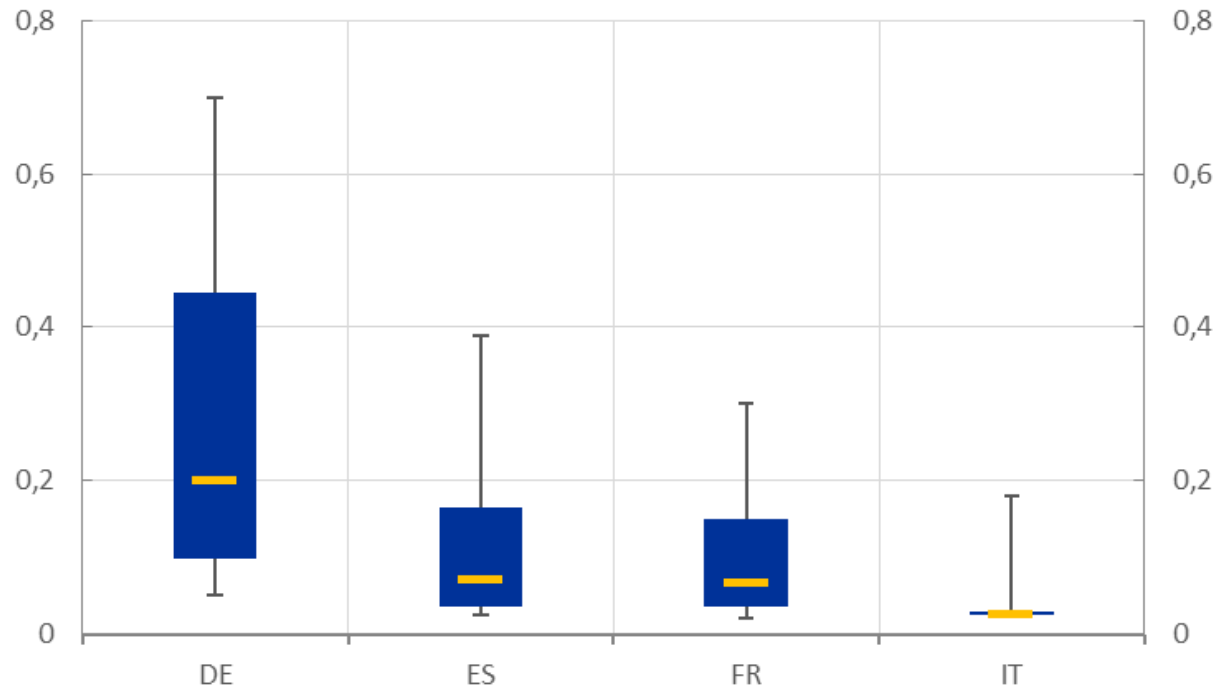
- Largest amount of funding in Spain and Italy
- Most of the funds allocated to SMEs in all countries

Guaranteed loans by number of firms



- Greatest number of firms involved in Italy and Spain
- In terms of number, small firms dominate everywhere

Amount of guaranteed loans (million euro)



- Largest loans in Germany: more loans given to large firms
- Smallest loans in Italy: many 100% guaranteed loans up to 25k given to small firms

Empirical strategy



Empirical strategy

- **Selection**: how do firms that received guaranteed loans differ from those that did not? Dimensions:
 - size, sector and risk
 - borrowing from banks with different size, liquidity, capital & NPLs
- **Substitution**: did banks issuing guaranteed loans reduce their non-guaranteed exposures?
 - Focus **only** on **firms with guarantees**:
 1. **at** firm level, estimate the **elasticity of non-guaranteed lending to the size of the guarantees**
 2. **within** each firm, compare the **change in non-guaranteed lending by banks with guarantees with that of banks without guarantees** (Khwaja-Mian, 2008)
 - Identify **firm and bank characteristics** for which substitution is larger

Results: selection



Which firms received guaranteed loans?

Note:
dependent
variable
 $I(\text{Guarantee}) =$
1 for firms
receiving
guaranteed
loans,
0 otherwise

| | I (Guarantee) (f) | | | |
|--------------------|-------------------------|------------------------|-------------------------|-------------------------|
| | (1) | (2) | (3) | (4) |
| Industry VA Growth | -4.673*** (0.302) | -5.018*** (0.363) | -4.975*** (0.360) | -5.019*** (0.365) |
| Firm Size | -0.0232*** (0.00985) | -0.0962*** (0.0118) | -0.0264*** (0.00957) | -0.0203*** (0.00966) |
| Firm Risk | -1.998*** (0.138) | -2.139*** (0.155) | -2.139*** (0.153) | -2.151*** (0.155) |
| Bank Assets | | 0.0916*** (0.0194) | 0.0734*** (0.0165) | 0.0925*** (0.0191) |
| Bank Liquidity | | 0.220*** (0.0738) | 0.673*** (0.0695) | 0.339*** (0.0723) |
| Bank Capital | | 0.0247*** (0.00873) | | 0.0252*** (0.00888) |
| Bank NPL | | | -0.223*** (0.0171) | -0.237*** (0.0172) |
| Country FE | Yes | Yes | Yes | Yes |
| R ² | 0.255 | 0.248 | 0.248 | 0.248 |
| N | 2534649 | 1874289 | 1883572 | 1853664 |

- Especially:
 - firms in more affected sectors
 - smaller firms but less risky ones (lower share of arrears)
 - borrowing from larger and stronger banks

Did the selection differ across countries?

Note:
dependent
variable
 $I(\text{Guarantee}) =$
1 for firms
receiving
guaranteed
loans,
0 otherwise

| | I (Guarantee) (f) | | | |
|--------------------|------------------------|------------------------|------------------------|-----------------------|
| | Germany (1) | Spain (2) | France (3) | Italy (4) |
| Industry VA Growth | -3.155*** (0.0916) | -3.605*** (0.172) | -7.195*** (0.201) | -3.582*** (0.128) |
| Firm Size | -0.0974*** (0.0140) | -0.0785*** (0.0205) | -0.0574*** (0.0136) | -0.0297** (0.0121) |
| Firm Risk | -0.793*** (0.0775) | -3.269*** (0.164) | -1.195*** (0.243) | -1.920*** (0.161) |
| Bank Assets | 0.00752 (0.0197) | 0.102 (0.0684) | 0.0861*** (0.0296) | 0.157*** (0.0282) |
| Bank Liquidity | 0.0146 (0.0304) | 0.157*** (0.0179) | 0.542** (0.0333) | 0.343*** (0.0726) |
| Bank Capital | 0.00317 (0.00923) | 0.0617** (0.0305) | 0.00880 (0.0168) | 0.0352*** (0.0110) |
| Bank NPL | -0.338*** (0.0279) | -0.152*** (0.0105) | -0.549*** (0.0389) | -0.163*** (0.0107) |
| R ² | 0.0377 | 0.142 | 0.232 | 0.118 |
| N | 252763 | 375621 | 684494 | 540786 |

- **No**, the selection of guarantee recipients was qualitatively similar across the four countries

Results: substitution



Measuring substitution

- How much did banks lending to a firm with a guaranteed loan change their pre-existing exposure to the firm?

$$y_i \equiv \frac{\Delta \textit{non-guaranteed credit}_i}{\textit{total initial credit}_i}$$

with initial date = February 2020, and final date = August 2020

- Measure of **substitution** = $-y_i$

Substitution: firm-level analysis

| | Dependent variable: $-y$ | | | |
|------------------------------|--------------------------|-------------------------|-------------------------|-------------------------|
| | (1) | (2) | (3) | (4) |
| Guarantee | 0.108*** (0.0241) | 0.137*** (0.0149) | 0.102*** (0.0153) | 0.128** (0.0150) |
| Guarantee*Industry VA Growth | -0.0659*** (0.0263) | -0.0901*** (0.0227) | -0.0908*** (0.0222) | -0.0910*** (0.0212) |
| Guarantee*Firm Size | -0.0611*** (0.00514) | -0.0981*** (0.00635) | -0.0768*** (0.00580) | -0.0651*** (0.00626) |
| Guarantee*Firm Risk | 0.171*** (0.0306) | 0.180*** (0.0312) | 0.189*** (0.0309) | 0.163*** (0.0312) |
| Guarantee*Bank Assets | | 0.0355*** (0.00956) | 0.0192* (0.00996) | 0.0354*** (0.00923) |
| Guarantee*Bank Liquidity | | 0.0730** (0.0325) | 0.0946** (0.0436) | 0.0588* (0.0330) |
| Guarantee*Bank Capital | | 0.161*** (0.0577) | | 0.173*** (0.0549) |
| Guarantee*Bank NPL | | | -0.141* (0.0778) | -0.166** (0.0645) |
| Country FE | Yes | Yes | Yes | Yes |
| Non interacted variables | Yes | Yes | Yes | Yes |
| R ² | 0.0661 | 0.0864 | 0.0737 | 0.0885 |
| N | 472206 | 427911 | 427691 | 426636 |

- On average, larger guarantees are associated with more substitution: elasticity of 0.13 \Rightarrow €1 guarantees \Rightarrow €0.87 total credit
- Elasticity is larger for firms:
 - in more affected sectors, smaller and riskier
 - borrowing from larger and stronger banks

Substitution: firm-level analysis, by country

| | Dependent variable: -y | | | |
|------------------------------|------------------------|-----------------------|-------------------------|-------------------------|
| | Germany (1) | Spain (2) | France (3) | Italy (4) |
| Guarantee | 0.196*** (0.0674) | 0.238*** (0.0497) | 0.0753*** (0.0146) | 0.109*** (0.0405) |
| Guarantee*Industry VA Growth | -0.103 (0.145) | -0.196*** (0.0499) | -0.225*** (0.0538) | -0.192*** (0.0429) |
| Guarantee*Firm Size | -0.00452 (0.00772) | -0.0125* (0.00712) | -0.0380*** (0.00807) | -0.0258*** (0.00492) |
| Guarantee*Firm Risk | 0.163 (0.246) | 0.288*** (0.0319) | 0.0962*** (0.0346) | 0.107* (0.0585) |
| Guarantee*Bank Assets | 0.0195*** (0.00459) | 0.0408 (0.0293) | 0.00836*** (0.00303) | 0.0586*** (0.0152) |
| Guarantee*Bank Liquidity | 0.0559*** (0.0155) | 0.0716 (0.0571) | 0.0417 (0.0278) | 0.246*** (0.0474) |
| Guarantee*Bank Capital | 0.463 (0.417) | 0.304*** (0.0963) | 0.0793 (0.164) | 0.262*** (0.0758) |
| Guarantee*Bank NPL | -0.349* (0.181) | -0.0697* (0.0370) | -0.514 (0.659) | -0.868*** (0.0780) |
| Non interacted variables | Yes | Yes | Yes | Yes |
| R2 | 0.0298 | 0.0918 | 0.0336 | 0.0514 |
| N | 7569 | 156629 | 70057 | 192381 |

- Elasticity ranging from 0.07 in France to 0.24 in Spain
- But heterogeneity matters in a similar way in all four countries

Substitution: firm-bank descriptive statistics

| | Guarantee | Average Δ bank-firm non-guaranteed credit (v) | Number of observations |
|-----------|-----------|--|------------------------|
| Euro Area | N | -0.038 | 240,310 |
| | Y | -0.361 | 223,068 |
| Germany | N | -0.020 | 4,967 |
| | Y | -0.080 | 2,213 |
| Spain | N | -0.002 | 98,006 |
| | Y | -0.448 | 127,234 |
| France | N | -0.005 | 5,914 |
| | Y | -0.089 | 7,891 |
| Italy | N | -0.068 | 131,423 |
| | Y | -0.266 | 85,730 |

- On average, in all four countries the bank issuing the guaranteed loan cuts its non-guaranteed exposure more than other banks lending to the same firm

Substitution: firm-bank level analysis

Note: I(Guarantee) = 1 for bank-firm relationships with guaranteed loans, 0 otherwise

| | Dependent variable: -y | | | |
|---------------------------------|------------------------|-----------------------|-----------------------|-------------------------|
| | (1) | (2) | (3) | (4) |
| I(Guarantee) | 0.210*** (0.0396) | 0.314*** (0.0509) | 0.281*** (0.0479) | 0.360*** (0.0340) |
| I(Guarantee)*Industry VA Growth | -0.168** (0.0708) | -0.157* (0.0811) | -0.172** (0.0725) | -0.185*** (0.0585) |
| I(Guarantee)*Firm Size | -0.00370 (0.00593) | -0.00429 (0.00585) | -0.00487 (0.00570) | -0.0271*** (0.00689) |
| I(Guarantee)*Firm Risk | 0.184*** (0.0486) | 0.132*** (0.0300) | 0.130*** (0.0336) | 0.130*** (0.0459) |
| I(Guarantee)*Bank Assets | 0.0496*** (0.0142) | 0.0180 (0.0177) | 0.0266 (0.0175) | 0.0257* (0.0140) |
| I(Guarantee)*Bank Liquidity | 0.109 (0.0794) | 0.0269 (0.0751) | 0.0774 (0.0748) | 0.0670 (0.0490) |
| I(Guarantee)*Bank Capital | 0.215 (0.974) | | 0.431 (0.735) | 0.586 (0.660) |
| I(Guarantee)*Bank NPL | | -1.505*** (0.272) | -1.073*** (0.113) | -1.644*** (0.209) |
| I(Guarantee)* Share of gran. | | | | -0.124** (0.0507) |
| I(Guarantee)*Drawn/Granted | | | | -0.128*** (0.0283) |
| Firm FE | Yes | Yes | Yes | Yes |
| Non interacted variables | Yes | Yes | Yes | Yes |
| r2 | 0.473 | 0.471 | 0.480 | 0.535 |
| N | 463378 | 460084 | 453694 | 452065 |

- Bank issuing guaranteed loans cuts its non-guaranteed exposure relative to other banks lending to the same firm:
 - more for weaker firms (more affected sectors, smaller and riskier)
 - more for larger and stronger banks

Within-firm selection of bank with guarantee

Note: here the dependent variable is the I(Guarantee) dummy at the bank-firm level

| Dependent Variable: | $G_{i,j}$ | | | | | |
|---------------------|-----------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | (1) | (2) | (3) | | | |
| Bank Assets | 0.0686*** (0.0206) | 0.0779** (0.0307) | 0.0695*** (0.0214) | 0.0805*** (0.0204) | 0.0925*** (0.0328) | 0.0806*** (0.0212) |
| Bank Liquidity | 0.0559 (0.0753) | 0.0371 (0.0885) | 0.0536 (0.0720) | 0.0742 (0.0701) | 0.0534 (0.0870) | 0.0739 (0.0677) |
| Bank Capital | 0.331*** (0.0654) | | 0.332*** (0.0640) | 0.407*** (0.0798) | | 0.407*** (0.0780) |
| Bank NPL | | -0.868 (1.752) | -0.616 (1.271) | | -0.612 (2.156) | -0.0616 (1.525) |
| Share of Granted | 0.887*** (0.0460) | 0.914*** (0.0508) | 0.883*** (0.0473) | 0.636*** (0.0432) | 0.684*** (0.0496) | 0.635*** (0.0434) |
| Drawn/Granted | 0.151* (0.0800) | 0.121* (0.0663) | 0.153** (0.0780) | 0.151** (0.0610) | 0.173*** (0.0540) | 0.151** (0.0593) |
| Residual Maturity | | | | 0.114*** (0.0185) | 0.107*** (0.0231) | 0.114*** (0.0184) |
| Firm FE | Yes | Yes | Yes | Yes | Yes | Yes |
| R ² | 0.447 | 0.418 | 0.447 | 0.493 | 0.453 | 0.493 |
| N | 452065 | 452065 | 452065 | 399002 | 399002 | 399002 |

- Even within-firm estimates may be biased by a different selection issue: the bank issuing the guaranteed loan is not randomly chosen
- But the characteristics of selected banks (higher capital & relationship banks, i.e. larger share of granted) are typically associated with greater supply of credit during shocks (e.g. Bolton et al. (2016), Jimenez et al. (2012)) \Rightarrow should lower substitution!

Substitution is supply or demand-driven?

- Already seen evidence that substitution is stronger for weaker firms which is suggestive of a supply-driven explanation

| Dependent Variable: | Interest rate on Guaranteed Loan | | |
|-----------------------------------|----------------------------------|---------------------------|---------------------------|
| | (1) | (2) | (3) |
| Substitution | 0.00521*** (0.000630) | 0.00554*** (0.000718) | 0.00553*** (0.000774) |
| Substitution x Industry VA Growth | -0.00340* (0.00186) | -0.00402** (0.00178) | -0.00383** (0.00190) |
| Substitution x Firm Size | -0.00074*** (0.000259) | -0.00075*** (0.000262) | -0.00073*** (0.000263) |
| Substitution x Firm Risk | 0.00755** (0.00323) | 0.00830** (0.00350) | 0.00729** (0.00351) |
| Country FE | Yes | Yes | Yes |
| Non interacted variables | Yes | Yes | Yes |
| R ² | 0.0759 | 0.110 | 0.108 |
| N | 285789 | 283480 | 277445 |

We also look at prices:

- Banks which substitute more charge also higher interest rates on the new guaranteed loans
- This effect is stronger for weaker firms



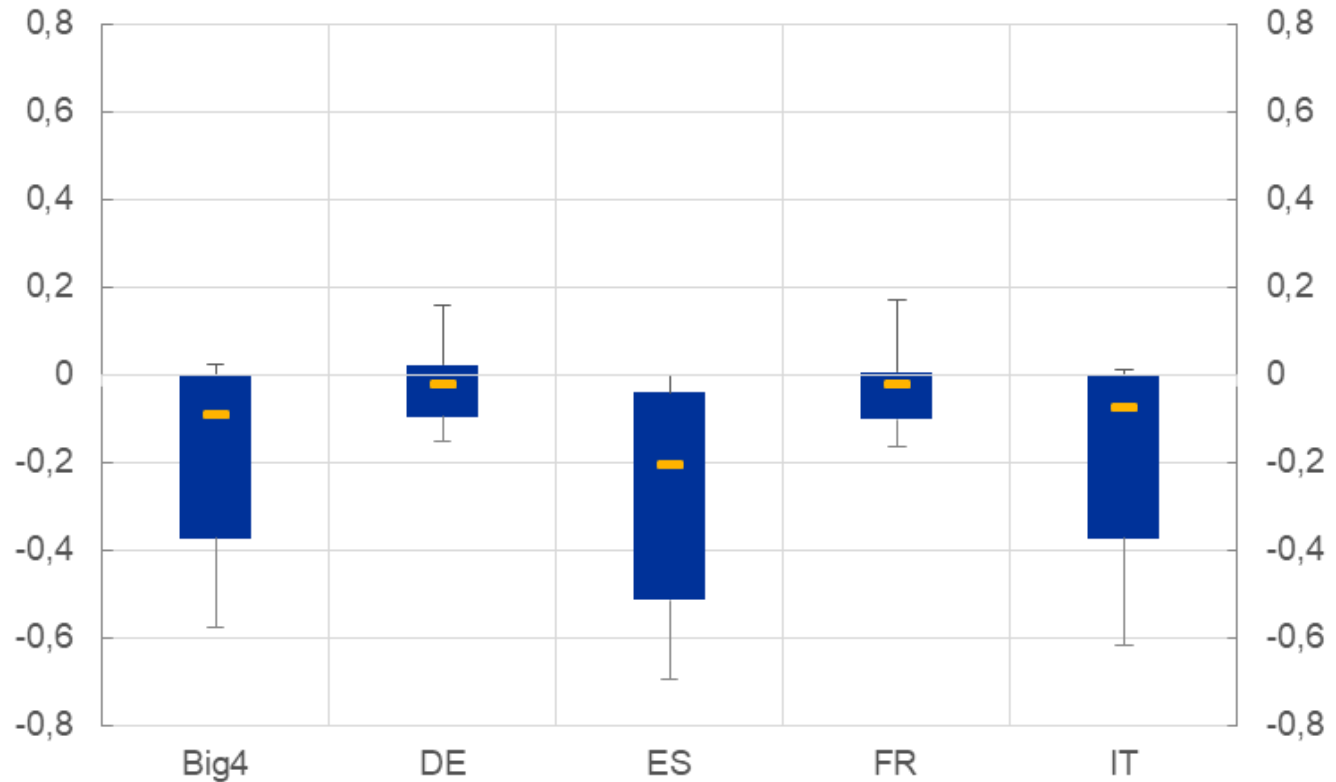
Conclusions

Conclusions

- On the whole, **good selection** of guarantee recipients:
 - guaranteed loans mainly directed to firms in affected sectors, but not those with highest pre-crisis risk level
 - similar selection in all countries despite different rules and institutions
- We are the first to document **substitution** between guaranteed loans and pre-existing exposure
- **different extent across countries**: smallest in France, largest in Spain
 - **but similar response to firm and bank characteristics**: positive response to credit risk suggests that it is **bank-driven**
 - **any policy upside?** Loan guarantees may have contributed to the recapitalization of banks exposed to firms hit by COVID-19
 - yet, substitution is greater for more solid banks!

Thank you!

||| Distribution of y for firms with guarantees



- In all four countries, substitution ($y < 0$) occurs for the majority of firms
- But much more so in Italy and Spain
- These differences may reflect cross-country differences in the firms that receive guaranteed credit