Investment expectations by vulnerable European firms in times of COVID: a difference-in-difference approach

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Background

- The Covid shock was HARSH and UNEQUAL
  - Heterogeneity by sector, region, liquidity, etc
- Policy seeks to assist vulnerable firms
  - In good times, and especially in bad times
  - BUT: which firms are most vulnerable?
  - Is support going to those in greatest need?

- This paper: investigating how the Covid shock affected investment expectations, for groups suspected as being vulnerable
  - HGEs, small, young, R&D investors, subsidiaries vs independent

Data

EIBIS…

- European Investment Bank Investment Survey
- Panel built from 2016-2020 waves
  - Around 12500 firms in each wave
- Focus in investment activities
- Representative data (stratified sampling) for the 27 EU MS's

…merged with ORBIS

- Bureau van Dijk
- Data on financials, ownership, etc

- Firms responded in May-August 2020 regarding future-looking expectations
- Responses can be compared to the SAME questions in previous years to see if Covid hit some firms especially hard

Dependent variables

- Expected change in investment
  - More than / around the same amount / less than last year
- Availability of internal finance
  - Improve; same; deteriorate
- Availability of external finance
  - Improve; same; deteriorate
- Industry's business prospects
  - Improve; same; deteriorate
- Overall economic climate
  - Improve; same; deteriorate
- Political and regulatory climate
  - Improve; same; deteriorate
- Investment priority over the next 3 years
  - New products/processes; Replacing capacity; Capacity expansion

Proxy for 'vulnerable' firms

- Subsidiary
- R&D investor
- HGE
- Small
  - i.e. below-median sales
- Young
  - i.e. below 10 years
- Young × small

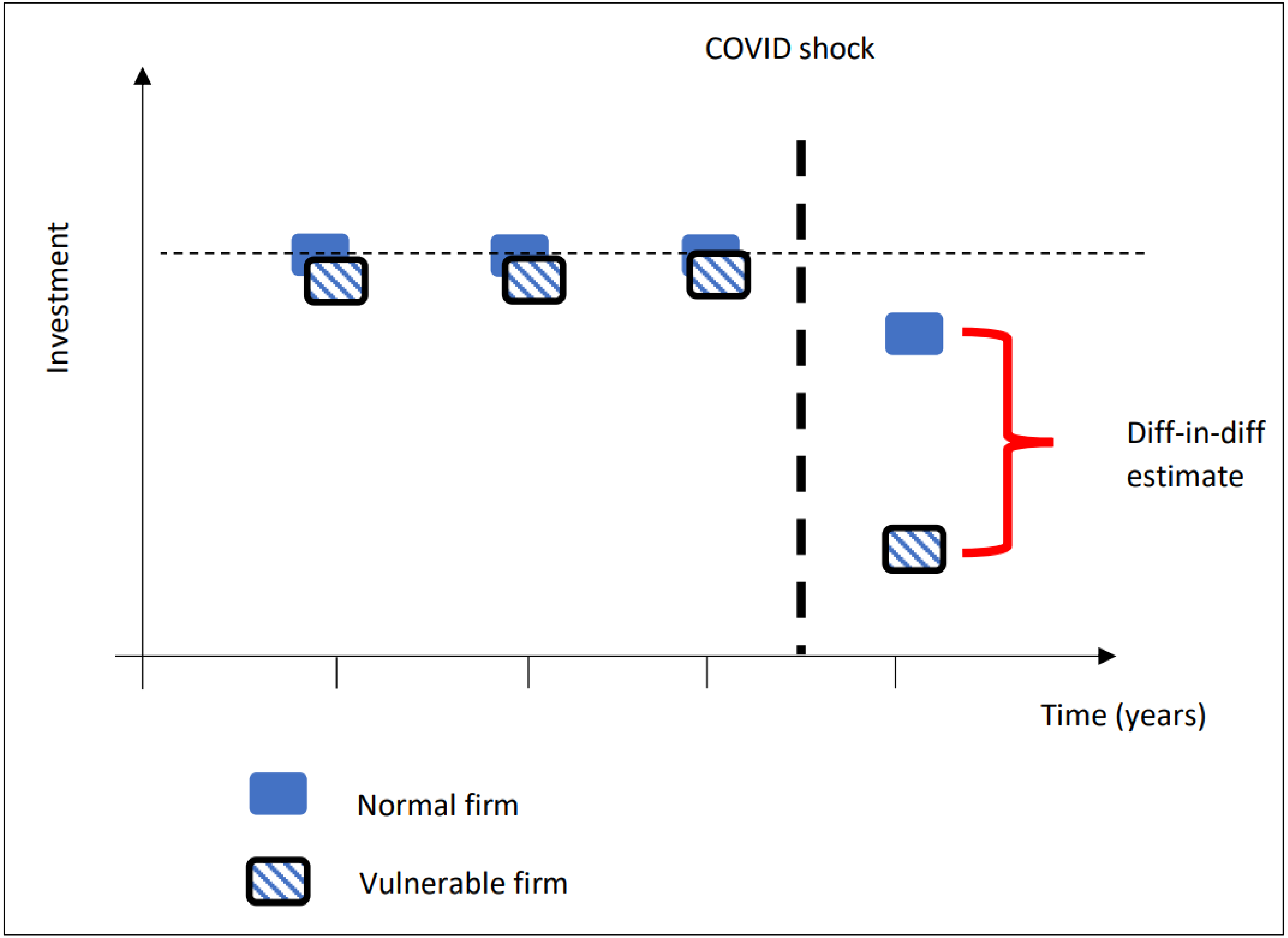
- Were vulnerable firms affected by Covid?

- Did the Covid shock hit vulnerable firms disproportionately hard (compared to non-vulnerable firms)?

Empirical strategy

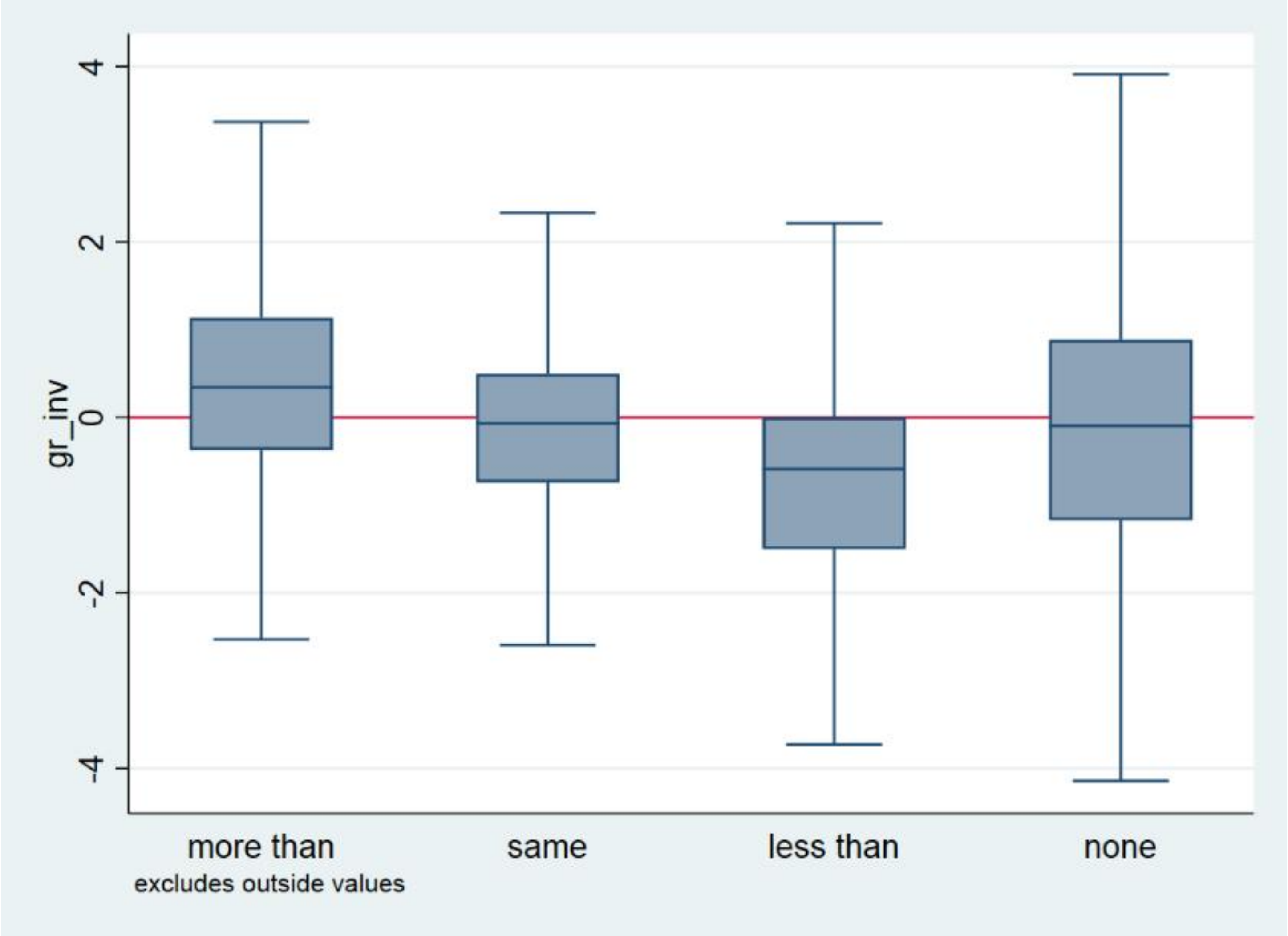
- Ideally: we observe post-COVID investment using actual numbers
  - Problem is: the data is not ready yet!
- Expected investment instead of actual investment
- Luckily for us, the same question was asked in previous survey waves

- All firms were hit, but were ‘vulnerable’ firms hit harder than others?
- Difference-in-difference approach
  - A.k.a. diff-in-diff, DiD, differ(differences)ences


COVID shock
Investment
Diff-in-diff
estimate
Time (years)
Normal firm
Vulnerable firm

Investment expectations are meaningful

- Expected investment (reported in EIBIS 2019) versus actual growth of investment over the period 2019-2020 (using information reported in EIBIS 2020)

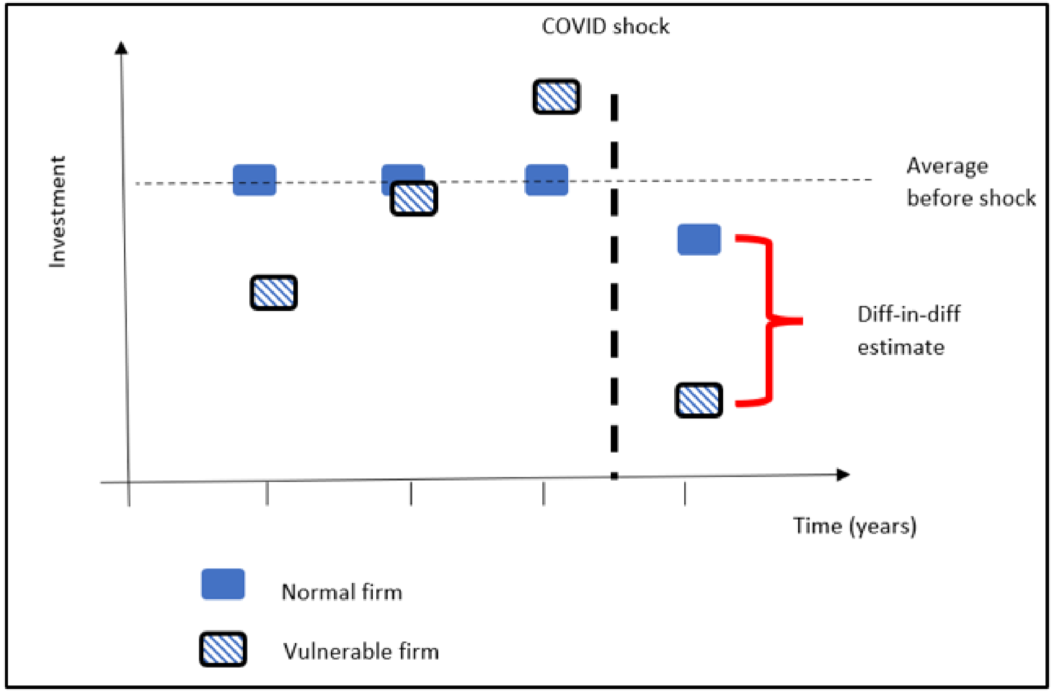


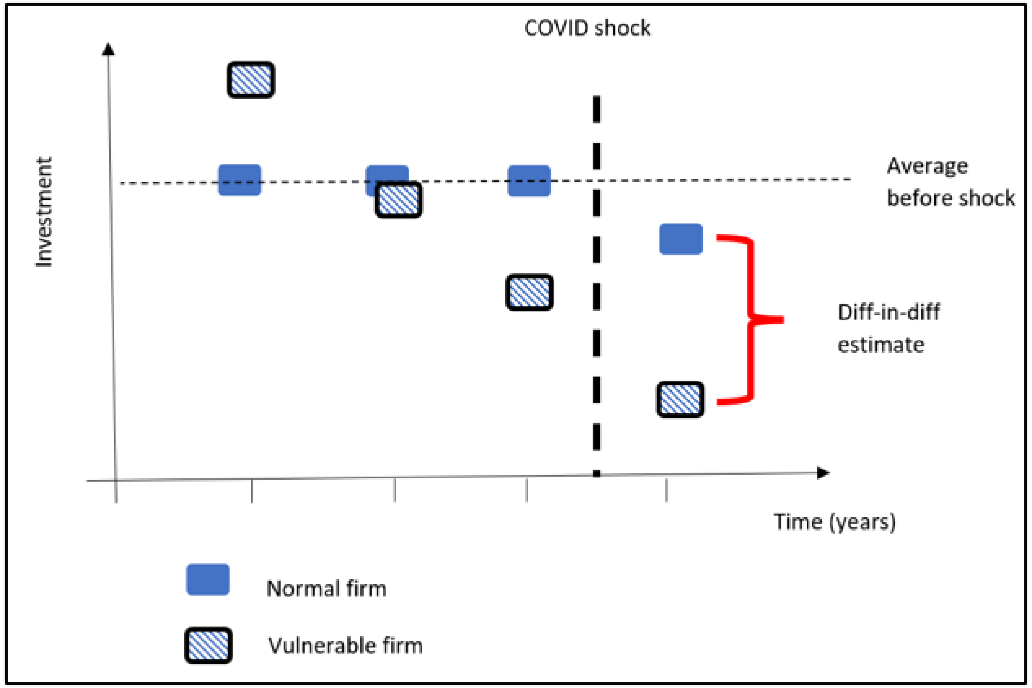
Regression results

- Expected change in investment
  - More likely to be negative: small, R&D, subsidiary
  - Less likely to be positive: HGE
- Availability of internal finance
  - Less likely to be positive: young, R&D
- Availability of external finance
  - More likely to be negative: HGE, R&D
  - Less likely to be positive: HGE, small, young × small

Event study graphs to complement regressions

- DiD regressions cannot clearly distinguish between these two cases, nevertheless they are distinguishable in event study graphs
- Graphs: country and sector FEs are controlled for

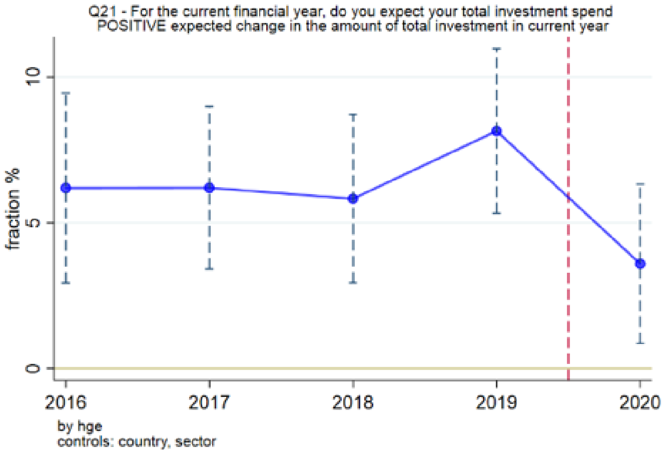




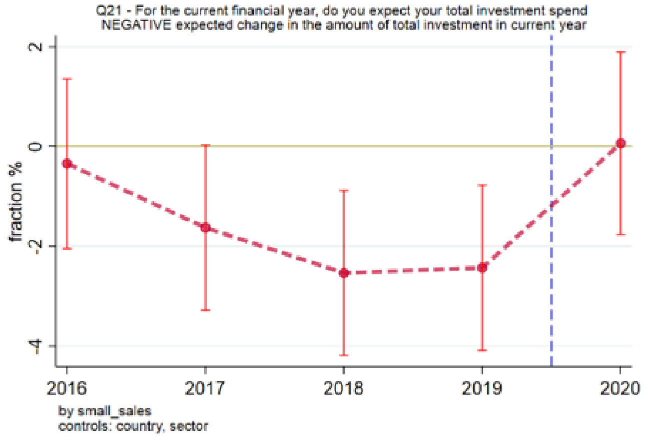
Changes in expected total investment

- HGEs less likely to increase investment
- More likely to expect to decrease investment:
  - Small firms
  - R&D investors
  - Subsidiaries

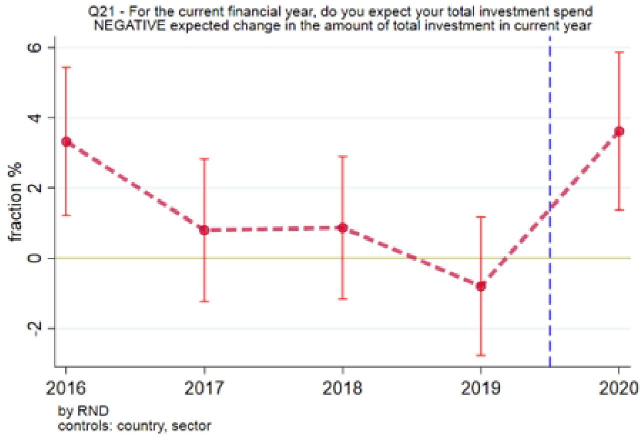
HGE



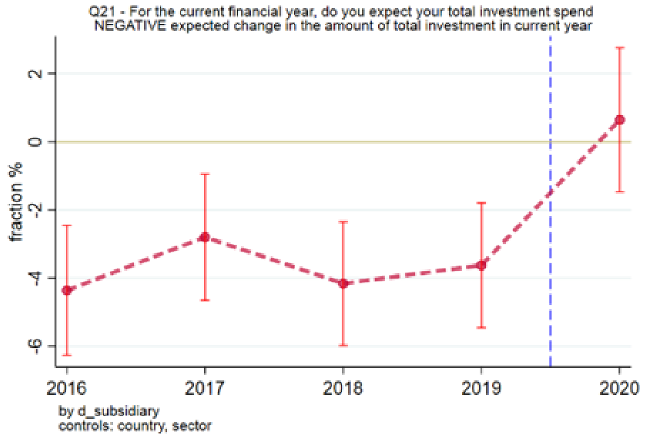
Small



R&D



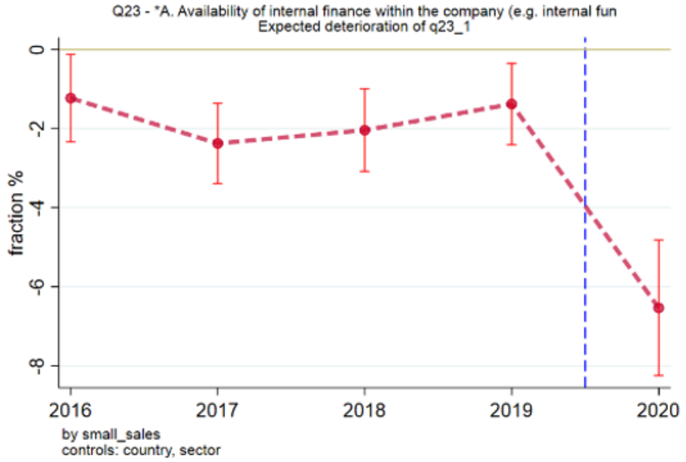
Subsidiaries



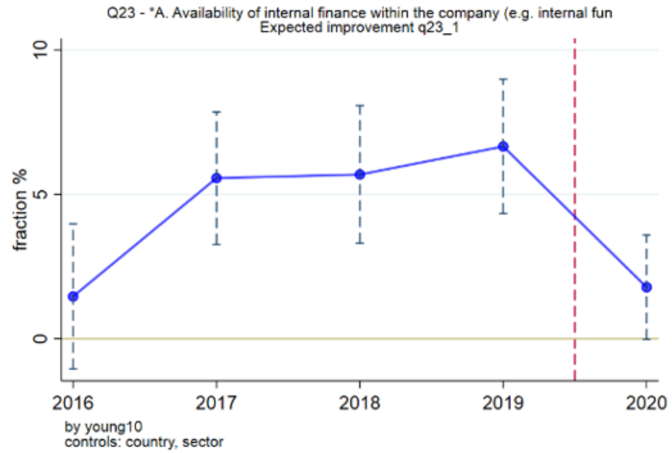
Availability of internal finance

- Small firms less likely to report an expected deterioration in internal finance
  - Surprising…
- Less likely to expect an improvement in internal finance:
  - Young firms
  - HGEs
  - R&D investors

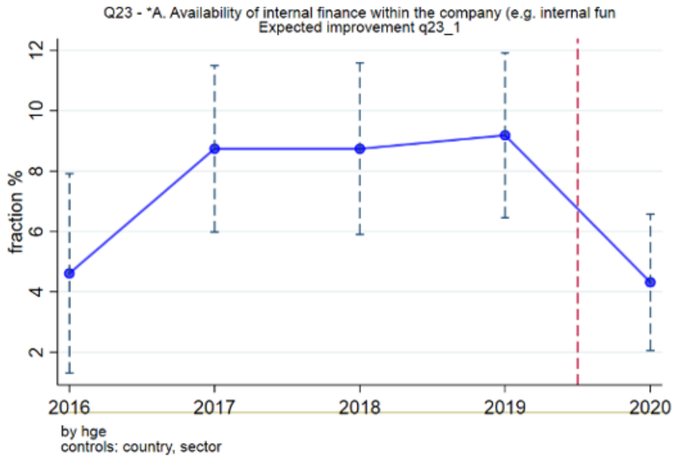
Small



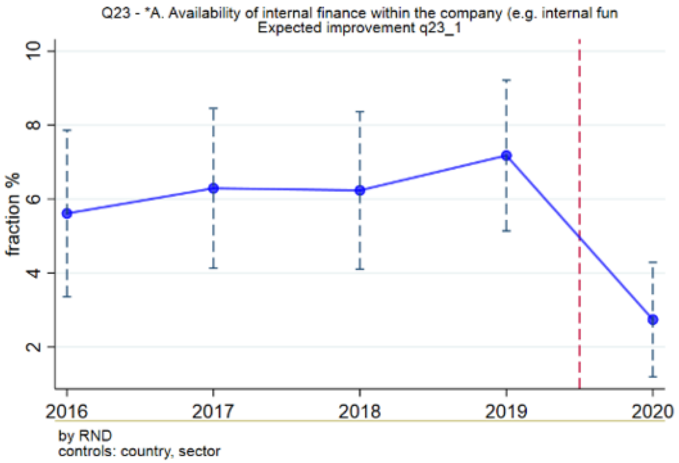
Young



HGE

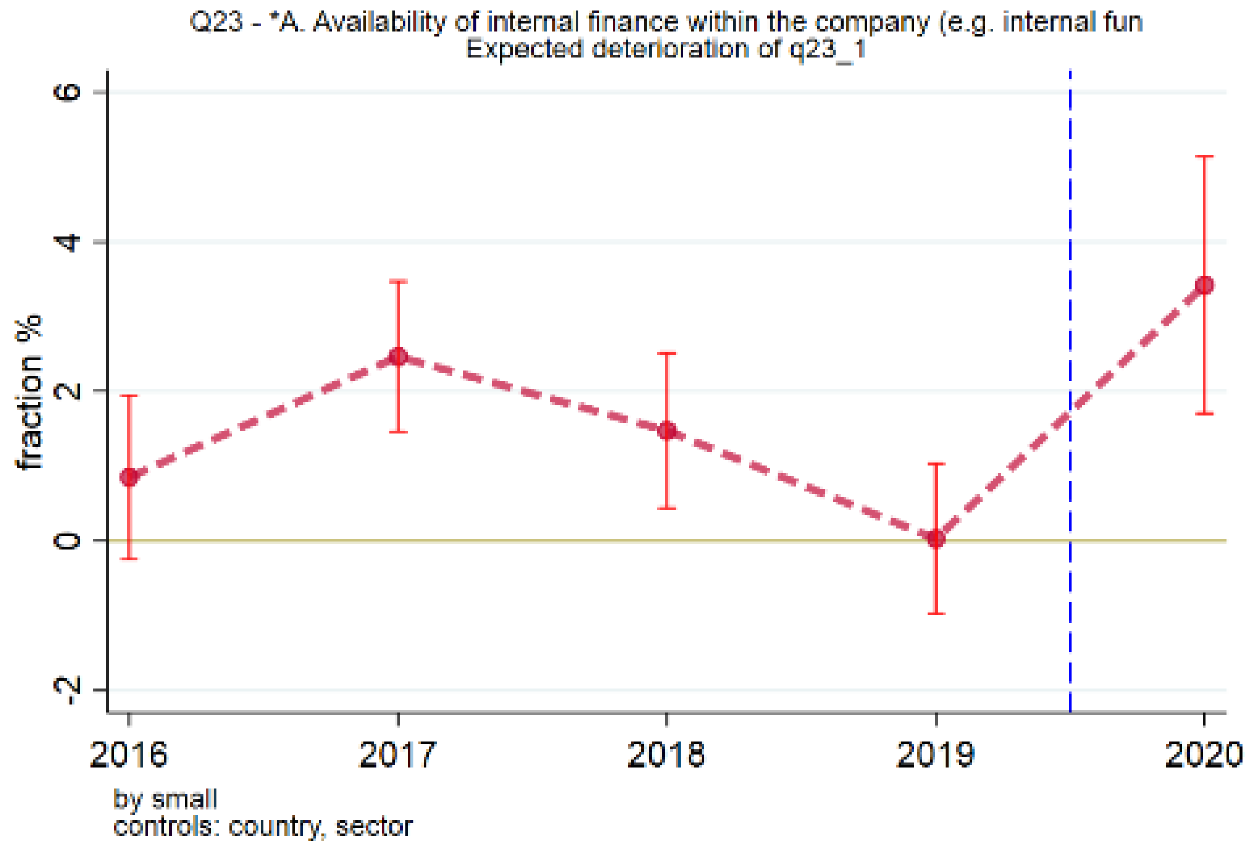


R&D



Deterioration of internal finance

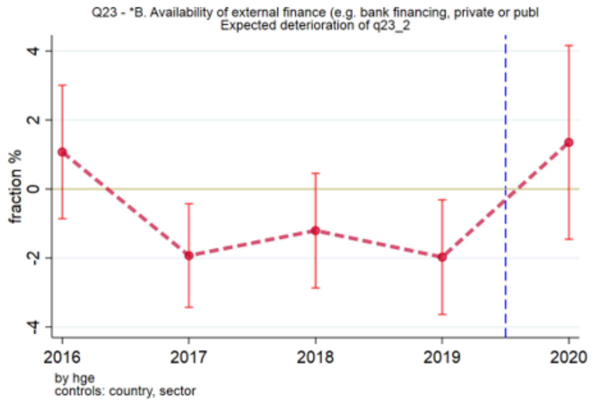
Alternative definition of small firms (i.e. <50 employees)



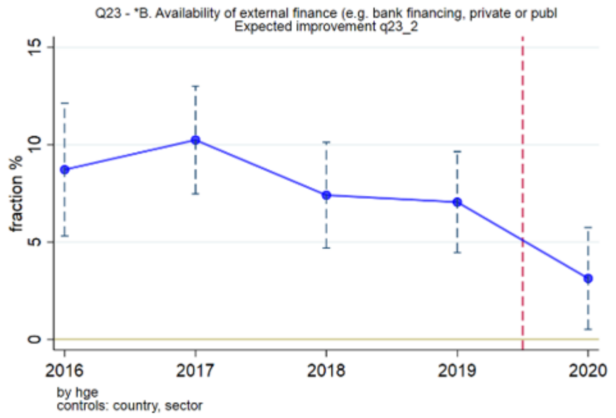
Availability of external finance

- HGEs
  - More likely to expect a deterioration
  - Less likely to expect an improvement
- R&D investors more likely to expect a deterioration in the availability of external finance
- Young × small firms less likely to be optimistic about the availability of external finance

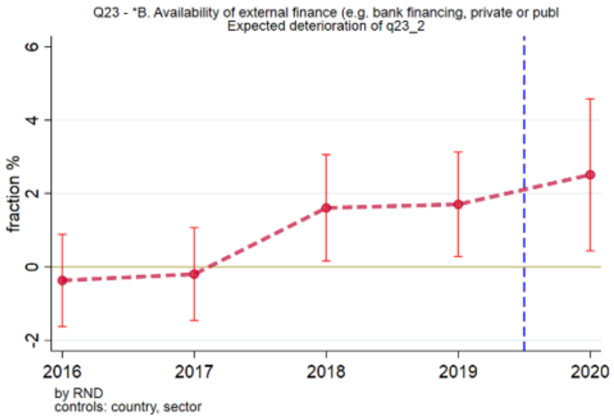
HGE



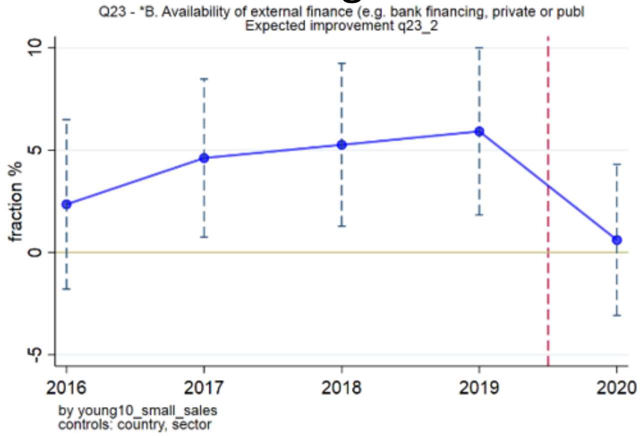
HGE



R&D



Young & small



SUMMARY OF FINDINGS

- HGEs are suddenly less likely to expect a positive change in investment, while small firms and R&D investors are suddenly more likely to expect a negative change in investment
- Young firms and R&D investors are less likely to be optimistic about the availability of internal finance for investment purposes
- HGEs and R&D investors are more likely to be pessimistic, and similarly small firms are less likely to be optimistic, about the availability of external finance

POLICY MESSAGES

- R&D investors seem particularly vulnerable
  - R&D investors are also pessimistic about their industry’s business prospects
- Concerns about availability of finance
  - External finance for HGEs and small firms
  - Internal finance for young firms
- NB: many results not statistically significant

CAVEATS

- Many of our results were not statistically significant
- Investment EXPECTATIONS rather than actual investment
- DiD assumptions not always satisfied, because of pre-COVID trends

IMPLICATIONS FOR FUTURE RESEARCH

- Use data on actual investment (when it becomes available, e.g. EIBIS 2021)
- Other potential groups of “vulnerable” firms:
  - digitalized firms; closer focus on vulnerable sectors and regions; financial vulnerability such as rejected bank loan applications
- Investigate causal channels & mechanisms regarding how Covid affects investment
  - Capacity utilization; changes in demand; financing conditions; increased uncertainty, etc

Thank you

APPENDIX: Difference in difference approach

$$Inv_{ict} = \beta_0 + \beta_1 crisis_t \times firm\_type_c + \beta_2 crisis_t + \beta_3 firm\_type_c + \beta_4 CONTROLS_{ict} + \varepsilon_{ict} \quad (1)$$

- Investment (expectations) depend on:
- Crisis (almost everyone was affected)
- Firm type (vulnerable even in good years)
- Control variables
  - Country, year, sector, firm FEs, country × year FEs, sector × year FEs
- Crisis × firm type
- β_1 is the coefficient of interest

APPENDIX: Regression results – Investment expectation

Estimates of the DiD coefficient of β_1 obtained from FE (i.e. within) regressions of equation (1).

	HGE	young	small	subsidiary	R&D	young × small
Expected change in investment: negative	-0.226	-4.015	**4.163**	**3.940**	**4.209**	-6.378
	-0.08	-1.55	2.51	2.11	2.07	-1.49
Expected change in investment: positive	**-5.541**	-1.315	-2.604	-1.996	-1.617	0.926
	-2.03	-0.55	-1.71	-1.13	-0.86	0.22

Source: EIBIS survey, our analysis. Notes: coefficients significant at the 5% level appear in bold. Controls include country × year and sector × year fixed effects. This table summarizes results from 2 × 6 = 12 different regressions (i.e. 2 alternative dependent variables and 6 alternative proxies for "vulnerable" firms). The table shows coefficients as well as t-statistics that are obtained after clustering the standard errors at the firm level. Control variables, constant term, and model fit statistics for the regressions are not shown here for conciseness.

APPENDIX: Regression results – Finance

Estimates of the DiD coefficient of β_1 obtained from FE (i.e. within) regressions of equation (1).

	HGE	young	small	subsidiary	R&D	young × small
Availability of internal finance: negative	-2.352	2.185	-2.679	-1.197	1.733	-2.297
	-1.02	0.99	-1.93	-0.77	1.03	-0.67
Availability of internal finance: positive	-3.270	**-5.338**	-1.229	0.087	**-4.847**	-3.838
	-1.30	-2.44	-0.97	0.06	-3.02	-0.99
Availability of external finance: negative	**6.328**	-3.049	0.535	-0.265	**4.428**	1.906
	2.62	-1.32	0.38	-0.18	2.60	0.52
Availability of external finance: positive	**-5.605**	-2.068	**-6.576**	-1.850	-0.677	**-11.129**
	-2.13	-0.85	-4.56	-1.14	-0.37	-2.80

Source: EIBIS survey, our analysis. Notes: coefficients significant at the 5% level appear in bold. Controls include country × year and sector × year fixed effects. This table summarizes results from 4 × 6 = 24 different regressions (i.e. 4 alternative dependent variables and 6 alternative proxies for "vulnerable" firms). The table shows coefficients as well as t-statistics that are obtained after clustering the standard errors at the firm level. Control variables, constant term, and model fit statistics for the regressions are not shown here for conciseness.