Swiss Leading House VPET-ECON

A Research Center on the Economics of Education, Firm Behavior and Training Policies

The Impact of Higher Education Institutions on Regional Firm Development

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Introduction

Motivation:

- Earlier Studies found positive effects of universities of applied sciences (UASs) on innovation and R&D employment *(Pfister et al., 2021; Schlegel et al, 2021; Lehnert et al. 2020)*
- However, unclear whether positive effects of UASs also translate into improved regional firm development, as measured by average profits per firm in a region.
- At aggregated level: innovation can have positive *(e.g., Czarnitzki & Kraft 2010; Kaiser 2009)* or negative effects *(e.g., Bloom et al. 2013; Chun et al. 2016)* on regional firm development.

Research question:

- Does the establishment of UASs have, overall, positive effects on regional firm development, as measured by average profits per firm?

Data – Linking two datasets at the municipality level

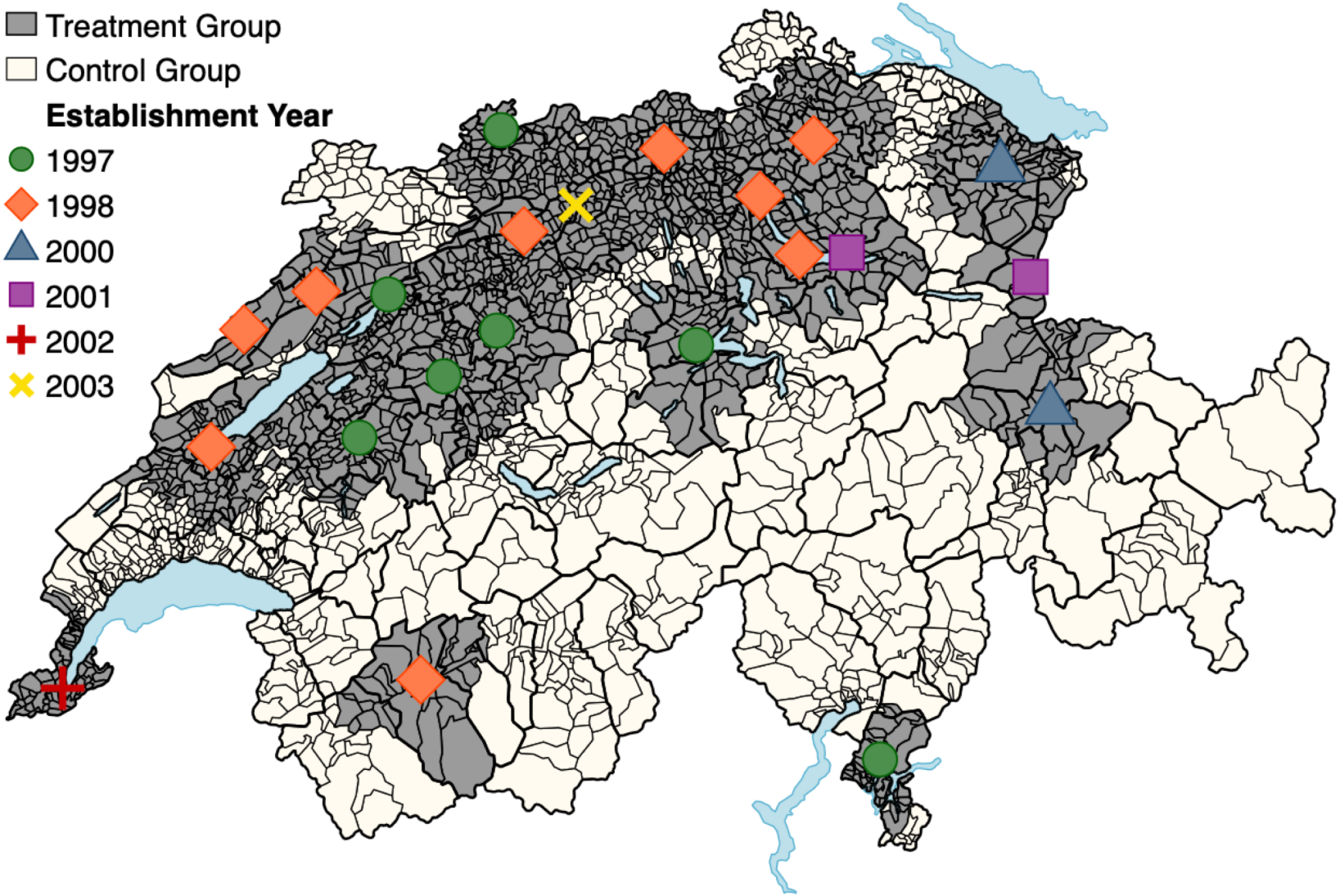
Average profits per firm at the municipality level (federal tax data)

- Aggregate firm profits (in CHF) and number of taxable firms used to calculate our dependent variable: *average profits per firm*
- Data goes back as far as 1971, on a yearly basis since 1998

Data on timing and location of the establishment of UASs in STEM ***(Pfister et al. 2018)***

- Focus on STEM: Want to find out whether earlier shown innovation impacts translate into increases in average profits per firm
- Period of analysis: 1997-2008
- Variation in time and space used to define treatment and control groups
- Treatment Group: Within 25-km (actual travel distance) of a UAS

Data – Establishment process of UASs



Empirical strategy

Two-way fixed effects DID

$$y_{ikt} = \delta \text{Treat}_i * \text{Post}_{i(t-3)} + \boldsymbol{x}'_{it}\boldsymbol{\beta} + \alpha_i + \lambda_{kt} + \varepsilon_{it},$$

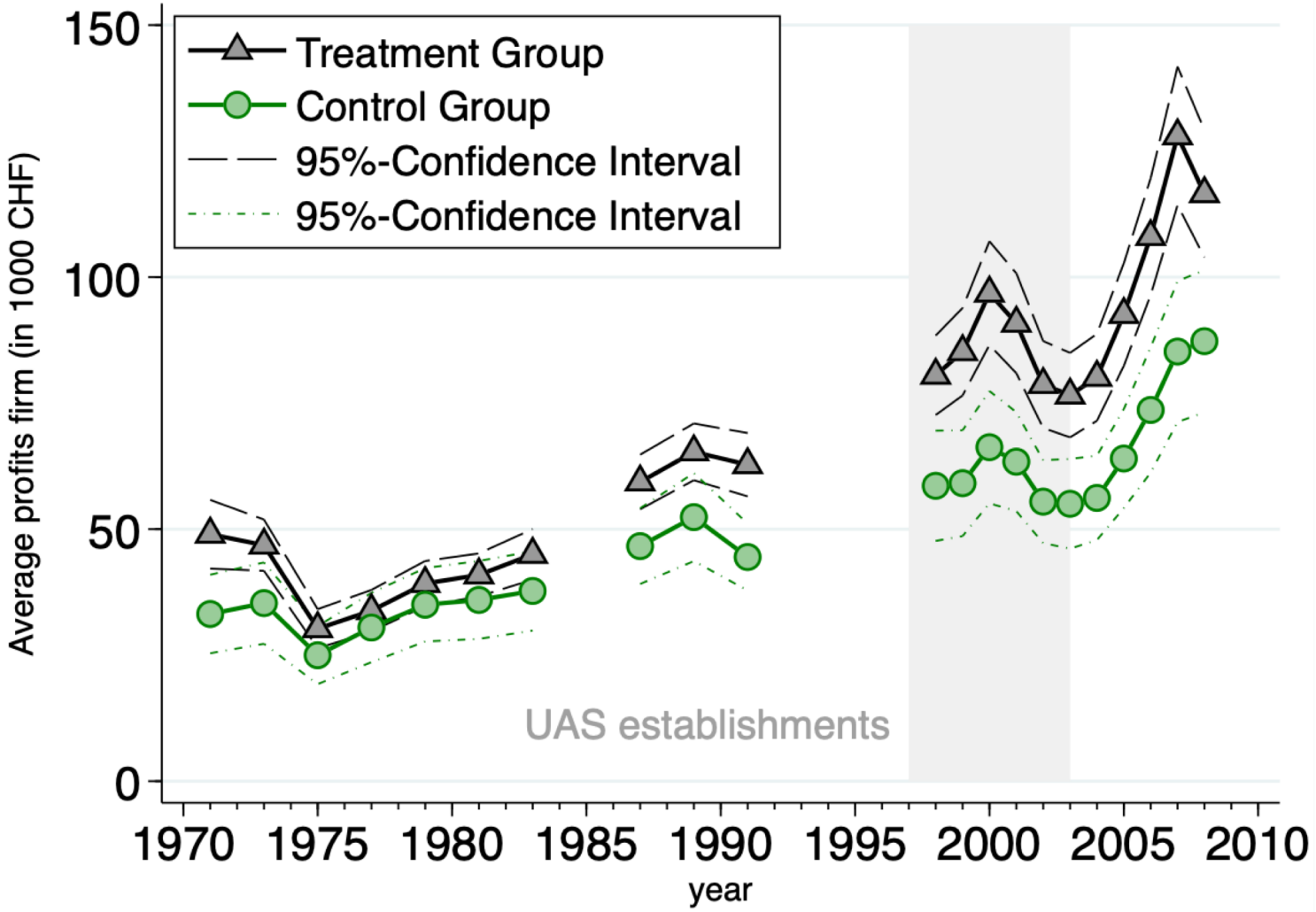
with i = municipality, k = canton, t = year,
$\boldsymbol{x_{it}}$ = control variables,
α_i = municipality fixed effects,
λ_{kt} = canton-specific time trends,
ϵ_{it} = standard error (clustered at municipality level)

Event study design

$$y_{ikt} = \sum_{j=\underline{j}}^{\bar{j}} \delta_j b_{it}^j + \boldsymbol{x}'_{it}\boldsymbol{\beta} + \tau D_{kt} + \alpha_i + \lambda_t + \varepsilon_{it}, \text{ with}$$

$$b_{it}^j = \begin{cases} \sum_{s=\underline{t}-\bar{e}}^{\underline{j}} d_{i,t-s} & \text{if} \quad j = \underline{j} \\ d_{i,t-j} & \text{if} \quad \underline{j} < j < \bar{j} \\ \sum_{s=\bar{j}}^{\bar{t}-\underline{e}} d_{i,t-s} & \text{if} \quad j = \bar{j}, \end{cases}$$

Identification strategy – parallel trends assumption

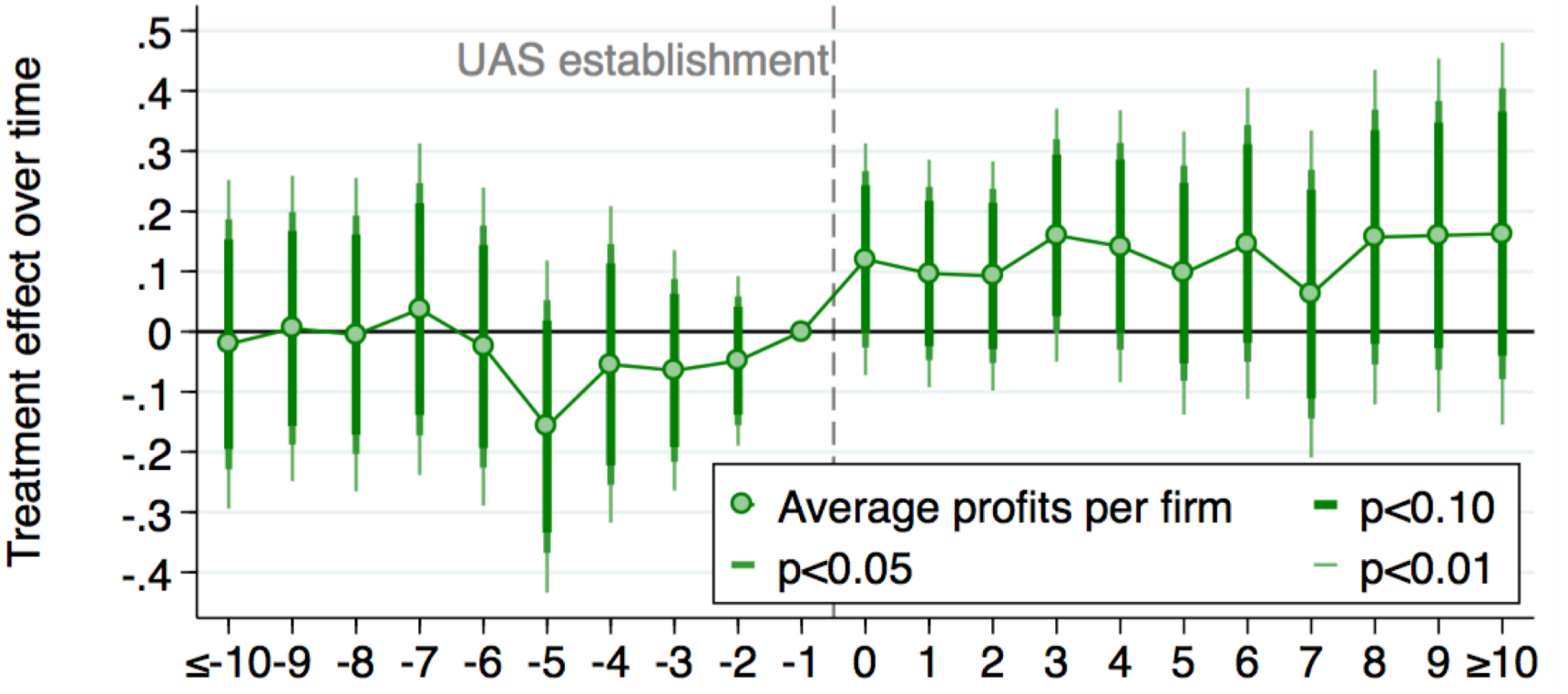


Results – DID

Dependent Variable: Average profits per firm	(1)	(2)	(3)	(4)	(5)
$\text{Treat}_i * \text{Post}_{i,t-3}$	0.5420***	0.4059***	0.2337***	0.2366***	0.1790***
	(0.0391)	(0.0498)	(0.0727)	(0.0688)	(0.0622)
Treat_i	0.0765	0.1085	0.0164	−0.0636	
	(0.0734)	(0.0737)	(0.0807)	(0.1114)	
Average corporate tax rate	No	Yes	Yes	Yes	Yes
Participation exemption	No	Yes	Yes	Yes	Yes
Canton-specific time trends	No	No	Yes	Yes	Yes
Regional labor market FE	No	No	No	Yes	No
Municipality FE	No	No	No	No	Yes
Observations	45,066	45,066	45,066	45,066	45,066
(Pseudo) R^2	0.033	0.058	0.157	0.235	0.758

→ Average profits per firm in treated municipalities increase on average by 19.6% more than in non-treated municipalities

Results – Event Study



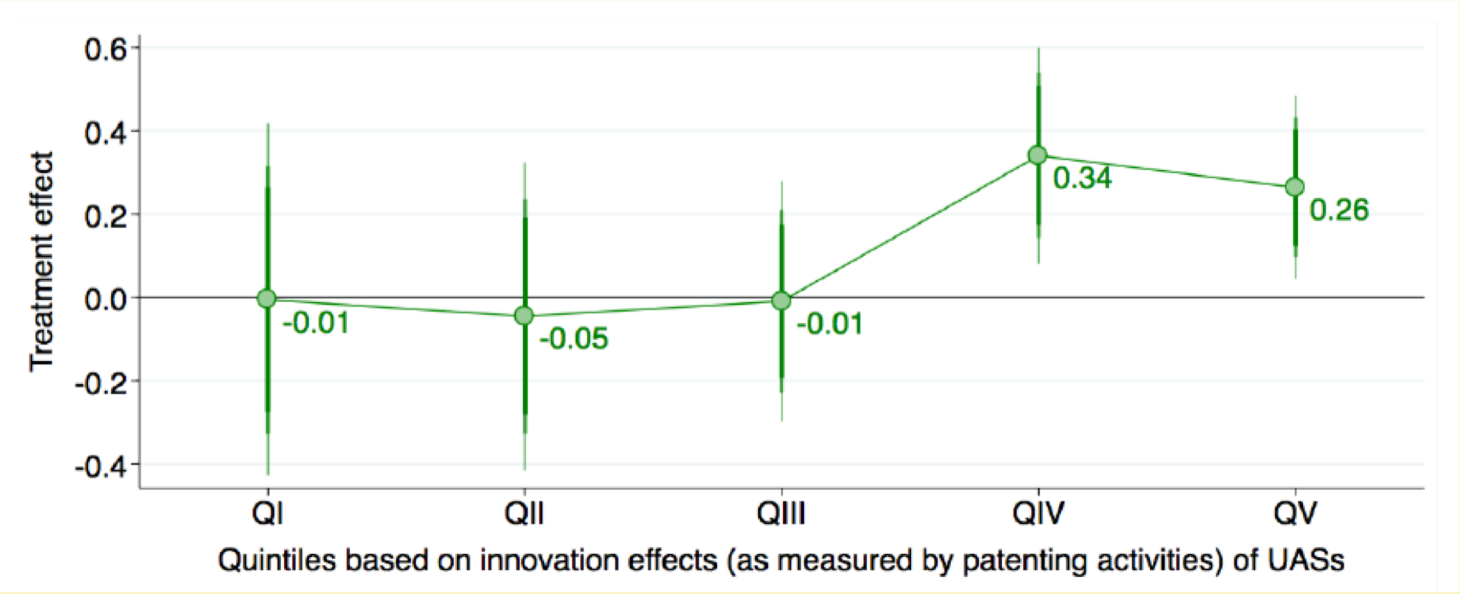
F-test for joint significance

- Posttreatment: coefficients between t=3 and t>=10 jointly significantly different from 0.
- Pretreatment: joint F-test does not reject H0.

Further Results and Robustness

Further analysis and robustness tests

- Positive effects of UASs on average profits per firm are, at least partly, driven by the positive effects of UASs on innovation.



- Robustness: Results are not driven by the particular composition of the treatment and control groups.

Conclusion

Conclusion

- Establishment of UASs contributed to positive regional firm development.
- The effects occur rather immediately and persist over the long run
- More generally: Repeatedly documented positive effects of higher education institutions seem also to translate into an improved regional firm development.

Thank you for your attention!

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For more information see:
"Tertiary Education Expansion and Regional Firm Development"
by T. Schlegel, C. Pfister & U. Backes-Gellner,
Swiss Leading House Economics of Education Working Paper No. 166.
(http://repec.business.uzh.ch/RePEc/iso/leadinghouse/0166_lhwpaper.pdf)

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