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The virtues of going virtual

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The virtues of going virtual

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Abstract

Career and job fairs are frequently used instruments to improve the matching between employees and employers as well as between employees and professions. Despite their importance, however, their impact has been under-researched. Using an innovative dataset that measures searches on the largest platform for apprenticeship vacancies in real-time and the necessity that some fairs had to switch from in-person to virtual during the COVID-19 phase unexpectedly, we can show that virtual fairs not only had a stronger immediate positive impact on the number of searches for apprenticeship vacancies but also expanded the search radius for different professions.

Keywords: Job fairs, career fairs, career choice, virtual versus in-person

JEL classification: J68, J24, I20

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1 Introduction

The quality of labor relations, in terms of productivity, job satisfaction, and stability, depends crucially on the quality of the match between employee and employer. Not least for this reason, job or career fairs are widespread, especially at universities, when individual employers or entire industries are looking for the best graduates. However, when it is not just about the choice of employer, but also about the choice of profession, there is another dimension to the quality of the match: information about the profession itself. In countries, such as Switzerland in this case, where young people have to make such a career choice at a very early age, information events are crucial for the quality of training and the subsequent career path (Mann et al., 2020).

Career fairs allow those interested in training or a job to obtain information about many professions within a limited time and geographical framework and thus optimize their decision-making with little effort (Abebe et al., 2017; Chakravorty et al., 2024; Silkes et al., 2010). Despite the potentially vital role that such events can play in helping (young) people to find a career, the effectiveness of career fairs has been poorly researched. This is all the more surprising as these events are associated with substantial costs for the organizers and the companies or sectors. Due to the high costs of the physical presence of in-person events, there have been trials and experiments with virtual events for some time (Brennan et al., 2004, or McIlveen et al., 2002 as very early examples and more recently Beam, 2016, and Matsuda & Hayashi, 2023 in developing countries). However, what is entirely missing is quantitative evidence and a comparison of virtual and in-person events.

In this study, we investigate the short-term effectiveness and efficiency of career fairs. Our analysis covers three dimensions: The attention they generate, the scope of the professions being explored, and the comparison of in-person events, which are more expensive, and their cheaper virtual counterparts. Career fairs typically have two main objectives. Firstly, they

should increase interest in vocational training, i.e., more young people should be interested in an apprenticeship due to a career fair and therefore also look for a vacancy. Secondly, and equally important, is expanding the range of choices for different professions. With about 200 possible apprenticeships, it is important that young people do not focus on just one or two and ignore that there may be other professions that would be a much better fit for them.

This study fills a gap in the literature in two respects. Firstly, we do not have to resort to qualitative surveys. Thanks to an innovative data set, we can observe the revealed behavior of people living in the catchment area of a career fair. Secondly, we are able to compare the effects of conducting different formats. From the first COVID-19 year (2020), some of these career fairs had to be unexpectedly converted from in-person to virtual, allowing us to have both in-person and virtual career fairs as treatments in each year of our observation period (2020-2022).

2 Data and Empirical Strategy

In this study, we use a novel and innovative data source. In Switzerland, most apprenticeship vacancies are registered on a public national online apprenticeship platform. This platform allows individuals to search for apprenticeship vacancies in their preferred profession and region. This is the most comprehensive and best-known source of apprenticeship vacancies, which guarantees the representativeness of the data. To follow the interest in the professions over time, we extract every user query searching for a vacancy from the 28th of February 2020 until the 31st of December 2022.

The main advantage of this data source is that we can monitor the individuals' revealed preferences with a high frequency since those who are interested in apprenticeship vacancies send out search queries. Individuals start searching as soon as their interest in an apprenticeship in a particular profession becomes concrete, and they stop searching as soon as they find an apprenticeship or lose interest. This gives us a good, high-frequency picture of interest in

apprenticeships by profession and region, which we can link to the location and timing of virtual and in-person fairs.¹

In total, we observed 34 career fairs at different times and locations in Switzerland, including 5 that were held virtually (for a list, see Appendix Table A1). Almost all 14-16-year-olds typically attend such career fairs as part of their preparation for career choices at the end of compulsory schooling. Sometimes, it is on their initiative, but mostly as part of regular school lessons, i.e., entire school classes in the catchment area of the fair visit it. The duration of a fair is typically up to one week.

Our empirical approach is formalized as:

$$Y_{ict} = \alpha + \beta A_{ct} + \gamma X_{ct} + \epsilon_{ict}.$$

The primary outcome variable Y_{ict} , aggregates the search queries by profession i , canton c , and day t . We use the logarithm of the number of search queries for easier interpretation. This leads to a total of 5,366,400 (26 cantons x 200 professions x 1032 days) observations. With the Herfindahl-Hirschman Index (HHI), a second outcome variable is constructed to measure the diversity of the potential apprentice's interests in professions for each day in each canton. The $HHI_{ct} := \sum_{i=1}^N \left(\frac{x_{ict}}{\sum_{j=1}^N x_{jct}} \right)^2$ calculates a number between $\frac{1}{N}$ and 1. It shows the concentration of search queries among all professions as the squared sum of every occupation divided by the sum of the search queries for all professions $\sum_{j=1}^N x_{jct}$. A low figure indicates that interest in professions is more equally distributed, and a high figure indicates a high concentration for specific professions.

We aim to measure the (intention-to-treat) effect of virtual and in-person fairs on interest in specific apprenticeships and the proportion of interest for each profession by constructing

¹ In another study, the longer-term relevance of changes in the search queries is shown where an increase in search queries translates to an increase in signed apprenticeship contracts (Goller & Wolter, 2023).

two binary (treatment) variables A_{ct} . They are constructed to be 1 if a virtual (respectively in-person) fair took place on day t in canton c , and 0 otherwise. Similarly, this is constructed for the seven days before and after the fairs. To separate the effect of interest from other influences that may distort the effect, we include several control variables X_{ct} , such as the day of the week, public holidays, school vacations, dummies for cantons, years, and month-fixed-effects (Goller and Wolter, 2021). Descriptive Statistics can be found in Appendix Table B1.

3 Results

Table 1

Impact of career fairs on interest in apprenticeship vacancies

	(1)	(2)	(3)
Fairs	0.062*** (0.021)	0.066*** (0.022)	
virtual fairs			0.174*** (0.024)
in-person fairs			0.039** (0.018)
Before fairs (7 days)		0.051** (0.020)	
After fairs (7 days)		0.049*** (0.017)	
N	5,366,400	5,366,400	5,366,400

Notes: The outcome is the log(search queries by day, canton, and profession). Each column shows a separate linear regression with control variables: school vacation, public holiday, day of the week, year, canton, and month. Robust standard errors are in parentheses. ** and *** indicate statistical significance at the 5% and 1% levels, respectively.

Table 1 shows the results from the linear regression for the influence of career fairs on interest in the form of search queries for apprenticeship vacancies. We find a positive and statistically significant relationship between career fairs and the interest in apprenticeship

vacancies. This is shown by a coefficient of 0.062 in column (1), which translates into a 6.2% higher interest in vacancies during fairs.

Interestingly, when separating virtual and in-person fairs, the effects substantially differ. While in-person fairs are associated with a 4% increase in interest, virtual fairs are associated with about 17% higher interest. Both related coefficients in column (3) are statistically different from zero and significantly different from each other (WALD test for equality of both coefficients; p-value: 0.000).

Table 2
Impact of career fairs on the occupational concentration of interest in apprenticeship vacancies

	(1)	(2)	(3)
Fairs	0.018** (0.007)	0.019** (0.008)	
virtual fairs			-0.022** (0.012)
in-person fairs			0.025*** (0.007)
Before fairs (7 days)		0.019** (0.008)	
After fairs (7 days)		0.019** (0.007)	
N	26,832	26,832	26,832

Notes: The outcome is the Herfindahl-Hirschman Index by canton and day, as described in Section 2. Each column shows a separate linear regression with control variables: school vacation, public holiday, day of the week, year, canton, and month. Robust standard errors are in parentheses. ** and *** indicate statistical significance at the 5% and 1% levels, respectively.

Besides increasing interest in apprenticeships, another goal of the career fairs is to make individuals aware of the full range of options. Table 2 shows estimates for the development of interest diversity for various professions in connection with career fairs. The increase in the HHI, in column (1), indicates lower diversity in interest during fairs. However, this is only the

case for in-person fairs, while virtual fairs broaden the search radius (column 3). The two different types of fairs, in-person and virtual, substantially differently affect the development of interest diversity (WALD test for equality of both coefficients; p-value: 0.001).

4 Conclusion and Discussion

An optimal job or skill match is undoubtedly an important prerequisite for productivity and job satisfaction, thus increasing the tenure on the job and reducing fluctuation costs for employers. For these reasons, it is not surprising that individual employers, but also industry or professional associations, are devoting a great deal of resources to targeted information about professions and employers in the form of career fairs in the hope that the quality of these matches will improve.

To the best of our knowledge, this is the first time that quantitative data shows that such fairs significantly increase search activity for professions, which is important for better match efficiency. However, contrary to the objective of the fairs considered here, the search radius for different occupations tends to narrow, which may contradict optimal match efficiency. Interestingly, the virtual fairs beat the in-person events in both dimensions: the search for vacancies' intensity and the search's breadth. Virtual events certainly also have disadvantages compared to physical face-to-face events, such as the lack of social interactions. Still, given that the cost of virtual events is a fraction of that of physical events, there is a case for using virtual fairs as a suitable tool not only in times of contact restrictions, such as the COVID-19 pandemic.

Declarations

Disclaimer

During the preparation of this work, the authors used DeepL to make grammatical and style changes. We used this tool only to improve the readability of the text. After using the tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

Availability of data and materials

The data supporting this study's findings are available from the Swiss Service Centre for Career Guidance (SDBB | CFSO). However, restrictions apply to the availability of these data, and therefore, the data are not publicly available.

Competing interests

None

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References

- Abebe, G. T., Caria, S., Fafchamps, M., Falco, P., Franklin, S., Quinn, S., & Shilpi, F. (2017). Job Fairs: Matching Firms and Workers in a Field Experiment in Ethiopia. *World Bank Policy Research Working Paper*, No. 8092.
- Beam, E. A. (2016). Do job fairs matter? Experimental evidence on the impact of job-fair attendance. *Journal of Development Economics*, 120, 32-40.
- Brennan, C., Daly, M., Fitzpatrick, E., & Sweeney, E. (2004). Tradition versus Technology: Careers Fairs in the 21st Century. *International Journal for Educational and Vocational Guidance*, 4, 23-41.
- Chakravorty, B., Arulampalam, W., Bhatiya, A. Y., Imbert, C., & Rathelot, R. (2024). Can information about jobs improve the effectiveness of vocational training? Experimental evidence from India. *Journal of Development Economics*, 103273.
- Goller, D., & Wolter, S. C. (2021). "Too shocked to search" The COVID-19 shutdowns' impact on the search for apprenticeships. *Swiss Journal of Economics and Statistics*, 157(6), 1-15.
- Goller, D., & Wolter, S. C. (2023). Reaching for Gold! The Impact of a Positive Reputation Shock on Career Choice. *IZA Discussion Paper*, No. 16607.
- Mann, A., Vanessa Denis, V., Schleicher, A., Ekhtiari, H., Forsyth, T., Liu, E. & Chambers, N. (2020). Dream jobs? Teenagers' career aspirations and the future of work, Paris: OECD Publishing, 1–55.
- Matsuda, N., & Hayashi, R. (2023). The Impact of an Online Job Fair: Experimental Evidence from Bangladesh. *Asian Development Bank Economics Working Paper Series*, 689.
- McIlveen, P., Gibson, E., Fallon, S., & Ross, P. (2002). Process evaluation of an internet career fair. *Australian Journal of Career Development*, 11(1), 5-8.
- Silkes, C., Adler, H., & Phillips, P. S. (2010). Hospitality Career Fairs: Student Perceptions of Value and Usefulness. *Journal of Human Resources in Hospitality & Tourism*, 9(2), 117-130.

Appendix A: List of career fairs

Table A1. List of career fairs

01. – 03.09.2020	BIM Aareland	Olten, Solothurn	in-person
17. – 19.09.2020	Berufsmesse Thurgau	Weinfelden, Thurgau	in-person
19. – 21.11.2020	Basler Berufsmesse	Basel, Basel-Stadt	virtual
17./18. 03.2021	Start! Forum des metiers	Fribourg, Fribourg	virtual
23./24. & 27.03.2021	BAM.connect	Bern, Bern	virtual
24. – 26.03.2021	Espoprofessionni	Lugano, Ticino	virtual
02. – 05.09.2021	Ostschweizer Bildungsausstellung	St.Gallen, St.Gallen	in-person
07. – 12.09.2021	Aargauische Berufsschau	Aarau, Aargau	in-person
09. – 11.09.2021	Schaffhauser Berufsmesse	Schaffhausen	in-person
09. – 13.09.2021	BAM.live	Bern, Bern	in-person
23. – 25.09.2021	Berufsmesse Thurgau	Weinfelden, Thurgau	in-person
27. – 31.10.2021	Berufsschau Baselland	Münchenstein, BaselLand	in-person
04.11.2021	Berufsmesse Derendingen	Derendingen, Solothurn	in-person
11. – 14.11.2021	Zentralschweizer Bildungsmesse	Luzern, Luzern	in-person
16. – 21.11.2021	Salon des metiers	Lausanne, Vaud	in-person
17. – 21.11.2021	Fiutscher	Chur, Graubünden	in-person
22. – 24.11.2021	Capa'cite des metiers	La Chaux-de-Fonds, Neuchatel	in-person
23. – 27.11.2021	Berufsmesse Zürich	Zürich, Zürich	in-person
08. – 13.02.2022	Start! Forum des metiers	Fribourg, Fribourg	in-person
17./18. & 21.03.2022	BAM.connect	Bern, Bern	virtual
23. – 27.03.2022	Le Salon interjurassien	Delemont, Jura	in-person
25. – 28.08.2022	BAM.live	Bern, Bern	in-person
30.08. – 01.09.2022	BIM Aareland	Olten, Solothurn	in-person
01.09. – 04.09.2022	Ostschweizer Bildungsausstellung	St.Gallen, St.Gallen	in-person
15. – 17.09.2022	Schaffhauser Berufsmesse	Schaffhausen	in-person
22. – 24.09.2022	Berufsmesse Thurgau	Weinfelden, Thurgau	in-person
20. – 22.10.2022	Basler Berufsmesse	Basel, Basel-Stadt	in-person
03.11.2022	Berufsmesse Derendingen	Derendingen, Solothurn	in-person
03. – 06.11.2022	Zentralschweizer Bildungsmesse	Luzern, Luzern	in-person
15. – 20.11.2022	Salon des metiers	Lausanne, Vaud	in-person
22. – 26.11.2022	Berufsmesse Zürich	Zürich, Zürich	in-person
22. – 27.11.2022	Cite des metiers	Geneve, Geneve	in-person

Appendix B: Descriptive Statistics

Table B1. Descriptive Statistics

	Mean	Standard deviation	N
Log (search queries by profession, canton, day)	0.360	(0.779)	5,366,400
Career fair	0.005	(0.069)	5,366,400
Career fair, 7 days before	0.009	(0.092)	5,366,400
Career fair, 7 days after	0.009	(0.092)	5,366,400
In-person fair	0.004	(0.064)	5,366,400
Virtual fair	0.001	(0.025)	5,366,400
Public holiday	0.026	(0.159)	5,366,400
School vacation	0.268	(0.443)	5,366,400
HHI Index (by canton and day)	0.109	(0.132)	26,832