

Have it Your Way: Demand Side Effects of Course Choices on the Return to Training

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Abstract

Consumption utility is presumably raised by choices. For public sponsored consumption goods, policy makers more and more often use vouchers-like allocation systems to provide choices. The German Training Voucher system is an example for the provision of choices between public sponsored further training courses. Such systems potentially improve the effectiveness of training programs from the demand side, because of an enhanced match quality and highly motivated training participants. However, in the presence of information failure or wrong incentives these positive effects might be reversed. The institutional implementation of training vouchers in Germany offers a quasi-experimental setting, which allows to identify demand side effects of course choices on labor market outcomes. Expanded course choices are found to have, if at all, negative impacts on the return to further training in terms of employment probabilities and earnings. Participants in short term and retraining programs as well as short term unemployed suffer most from expanded course choices.

JEL-Classification: J68, H43, C21

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1 Introduction

Offering freedom in terms of how individuals can choose goods and services has been proposed to improve social welfare. Proponents argue that expanded choices increase consumer utility and competition among producers of goods and services. Opponents are worried that too many choices impair social welfare. In particular, this might be relevant in the presence of information asymmetries or wrong incentives. In recent years, voucher-like systems, as instrument to increase consumer choice between public sponsored services, become more and more popular. School choice is a prominent example for public services which are allocation through voucher-like systems in practice.¹ In the context of public sponsored further training, the Adult and Dislocated Worker Program under the Workforce Investment Act (WIA) in the United States and the German Training Vouchers are the largest programs using voucher-like allocation mechanisms.² In this paper, we study demand side effects of increasing course choice for training participants on the return to further training in Germany.

The institutional implementation of training vouchers in Germany offers a quasi-experimental setting, which allows to identify the effects of course choices on pre-treatment labor market outcomes. The provision of public sponsored further training in Germany was organized within a direct assignment system. Caseworkers could assign training participants to suitable courses based on subjective measures. The German Training Voucher system was implemented in 2003, with a two months transition period in which both allocation mechanisms coexisted. We exploit this transition period to identify comparable participants in similar courses with different options of choice. Accordingly, this study focuses on demand side effects of enhanced course choices.³ Demand side effects can be

¹See Angrist, Bettinger, King, and Kremer (2002), Cullen, Jacob, and Levitt (2005, 2006), Hsieh and Urquiola (2006), Krueger and Zhu (2004), and Rouse (1998) among others.

²See Heinrich, Mueser, Troske, Jeon, and Kahvecioglu (2010, 2011) for an evaluation of the services provided by the Adult and Dislocated Worker Program. See Doerr et al. (2013) for an evaluation of German Training Vouchers.

³Potential effects of an increased competition between training providers, due to the introduction of market mechanisms (see the principal ideas of Friedman, 1962, 1955), are not subject of this study. We avoid such effects by comparing individuals in similar courses during the same time period. Doerr and Strittmatter (2013) and Rinne, Uhlendorff, and Zhao (2013) identify institutional effects of the reform, which capture also supply side effects. They report positive institutional effects in the short run, which can be explained by program durations and compositions. In the medium term they report negative effects and in the long term they find no significant influence of the institutional design. Both studies rely on more restrictive assumptions than we do to identify their parameters of interest.

explained by the behaviour of consumers. In the training voucher example, demand side effects can be associated with different matches between participants and courses as well as different attitudes of participants towards training.

Proponents of training vouchers claim that increased choices result in better match qualities between training participants and training courses. This argument may be true if all voucher recipients are well-informed about offered courses. In case of information asymmetry, caseworkers with their accumulated experience and expertise can potentially find better suited courses than unemployed. Barnow (2009) strongly emphasize the problem of information failure, in his survey about the consequences of vouchers in United States training programs. Possibly providers of training courses try to acquire participants by giving wrong incentives to voucher recipients. In Germany, regulations aim to avoid market failures from wrong incentives. Further training providers and courses have to be certified by independent institutions. The increased freedom of choice may also affects the attitude towards training in a positive way. Unemployed may perceive further training more like an offer and less like an assignment under the voucher regime. This could result in highly motivated participants, which potentially accumulate more human capital during training and increase their search effort thereafter. In this sense expanded choices can generate positive incentives.⁴ On the negative side, unemployed could be overstrained by too many choices, which might result in lower motivation.

Obviously, demand side effects coincide with the total effects of choices if the quality of consumption goods cannot be raised by competition among producers. This might be the case for standardized products and services. For example, the utility from having a forklift license does probably not depend very much on the quality of the course, because of standardized curriculums and test procedures. Nevertheless, supply side effects of course choices cannot be generally excluded.⁵ From a policy perspective it is interesting to have knowledge about the impact of choices from the demand and the supply side,

⁴The existing evidence about the effects of incentives on labor market outcomes is mixed. Arni, Lalive, and Van den Berg (2012) present positive earnings effects of policies which are likely to be perceived positively by participants. At the same time, there exist strong evidence that negative incentives or threat effects have positive impacts on employment outcomes (Abbring, Van den Berg, and Van Ours, 2005, Arni, Lalive, and Van Ours, 2013, Black, Smith, Berger, and Noel, 2003, Graversen and Van Ours, 2008, Lalive, Van Ours, and Zweimüller, 2005, Rosholm and Svarer, 2008).

⁵For education vouchers, the review of Levine and Belfield (2002) reports the effect of competition to be positive but modest in size. Critical thoughts about the introduction of competition between providers of education can be found in Prasch and Sheth (2000).

respectively. In the case these two effects work in opposite directions, policy makers should aim at developing institutional setups which stimulate only the side which is presumed to have positive impacts on pre-treatment outcomes. Here we focus on the consumer side. Our results suggest that expanded choices have, if at all, negative impacts on the return of further training. Estimating heterogenous effects by program type and unemployment duration, we find that participants in short term and retraining programs as well as short-term unemployed suffer most from expanded course choices. This suggests that policy makers should not give course choices to potential participants, but does not exclude that a potential increase in the competition between the providers of courses has positive influences.

Our analysis is based on unique process generated data provided by the Federal Employment Agency of Germany. The data contain a 100% sample of all further training participants during the transition period. It is enriched by a large set of individual and regional specific control variables. We address potential selection issues by implementing an instrumental variable identification strategy. Therefore, we exploit regional variation in voucher intensities as instrument.⁶ Germany has 181 regional employment offices. Thereof, 55 regional employment offices refused the implementation of the voucher system during the transition period. This can be partly explained by the fact that managers and caseworkers in different employment offices have different attitudes towards the voucher system (see Doerr and Kruppe, 2013). Especially during the transition period, the introduction of vouchers was judged very differently by different teams. The implementation of training vouchers resulted in large-scale changes of the assignment process into further training not only for training participants, but also for caseworkers. The reform caused a loss of authority in the allocation of training courses, which might lead to negative attitudes regarding the reform. Positive attitudes towards the reform could result from the reduced work burden for caseworkers. Furthermore, some managers supported the idea of freedom of choice for unemployed, while others have been sceptical. We assume that this variation in the instrument reflects an exogenous policy style.

The remainder of the paper is structured as follows. In Section 2 we provide institutional background on the implementation of training vouchers in Germany. The data and

⁶Similar ideas can be found in Doerr et al. (2013), Doerr, Fitzenberger, Paul, and Strittmatter (2013), and Frölich and Lechner (2010).

summary statistics are presented in Section 3. Section 4 analyzes the impact of expanded choice on the return of further training. The empirical strategy and details about how we use the exogenous variation in voucher intensity as instrument is presented in this section. The final section concludes.

2 Institutional Background

The provision of further training is traditionally a major part of ALMP in Germany. Between 2000 and 2002 the expenditures exceeded 20 billion Euros. Further training is used as instrument to adjust skills to changing requirements of the labor market and/or to changed individual conditions (due to health problems for example). Accordingly, the primary goal of further training is the provision of occupation-specific skills. This includes the possibility to acquire a (new) vocational degree within the German apprenticeship system in which the obtained certificates or vocational degrees serve as important signaling device for employers.

The large variety of further training courses can be mainly classified in three types of programs: practice firm training, classical short training (maximum duration 6 months), classical long training (minimum duration 6 months), and retraining.⁷ Teaching takes place in class rooms or on-the-job. Typical examples of classical further training schemes are courses on IT based accounting or on customer orientation and sales approach. Retraining programs have a long duration up to three years. They cover for example the full curriculum of vocational training for a physical therapist, office clerk or tax consultant assistant.

The direct assignment of training participants to courses was replaced by a voucher system in January 2003 as part of the Hartz-Reform which is known as a substantial reform of Germany's labor market. In contrast to the former institutional setup in which caseworkers had strong authority and based the assignment decisions into courses on subjective measures, the freedom of choice of training participants is strongly expanded through training vouchers.⁸ Voucher recipients are free to choose the most suitable train-

⁷We follow the classification of program types as proposed by Lechner, Miquel, and Wunsch (2011).

⁸Simultaneously with the voucher system, stricter selection criteria were implemented. The post-reform paradigm of the Federal Employment Agency focuses on direct and fast placement of unemployed individuals, high reintegration rates and low dropout rates. But this is not focus of this study.

ing provider and course subject to the following restrictions: the courses objective, the training content, the planned duration of the course, and the voucher validity are specified on the voucher.⁹ Caseworkers are not allowed to influence the voucher recipients choice towards a specific provider or course. Training providers can place information material about offered courses in the regional employment offices. In addition, voucher recipients can rely on a pool of information about further training courses provided as an online platform sponsored by the Federal Employment Agency.

The voucher-like system differs from the former direct assignment system in particular with regard to sanctions. Voucher recipients are not sanctioned if the voucher is not redeemed, but they have to give reasonable explanations for not redeeming it.¹⁰ Before the reform caseworkers had the possibility to cut unemployment benefits completely for a duration of twelve weeks if unemployed refused to participate in ALMP. However, it is unclear to which extent unemployed were involved in the decision to participate in further training programs before the reform and what happened if they did not correspond to the caseworkers decisions.¹¹

Training vouchers were implemented during a transition period of two months. During January and February 2003 the provision of further training courses was yet organized with training vouchers, but unemployed who are counseled by caseworkers towards further training programs and agreed upon a participation before the reform, participated in training courses without training vouchers during the transition period. From March 2003 onwards, training participation was exclusively organized through the voucher system. How we identify treatment and control persons and what characterize this two populations will be described in the next section.

⁹The validity of training vouchers range between one week and maximum three months.

¹⁰Beside the individual choice not to start a program, there are several more reasons for non-participation. There may be problems of reaching the provider because of a lack of public transport infrastructure or if the provider rejects the contract. The last could be due to performance standards of providers, i.e. training providers could reject clients when they predict low employment probabilities after training.

¹¹Hofmann (2012) reports about 10,000 imposed sanctions per year for refusing participation in ALMP in 2001 and 2002. This corresponds to a sanction rate of about 0.4% (# of ALMP refusal sanction/stock registered unemployed). The sanction policy of regional employment offices varied strongly, in particular with respect to regional labor market situations (Müller and Steiner, 2008).

3 Data and summary statistics

The existence of a period of transition during the reform implementation give us the possibility to study the impact of expanded choice in a quasi-experimental setting. During the transition period of two months we observe direct assigned individuals as well as voucher recipients in similar courses. Working with administrative data provided by the Federal Employment Agency of Germany, we observe all individuals who received a training voucher in January and February 2003 and all individuals who started a direct assigned training course in this time period. The program data includes precise start and end dates of further training courses as well as precise award and redemption dates for each voucher. The individual data contains daily information on employment subject to social security contributions, receipt of transfer payments during unemployment, job search, and participation in different active labor market programs as well as rich individual information.¹²

To evaluate the relative effectiveness of expanded course choice, we follow each individual in the evaluation sample over a period of 5 years and 9 months beyond the program starts. We focus on the return of further training measured as employment probability and monthly earnings. The evaluation sample is constructed as inflow sample into unemployment.¹³ We consider individuals who enter unemployment between 2001 and 2002 after having been continuously employed for at least three months. The sample is restricted to those individuals who start training courses in January and February 2003 either after having received a training voucher (treatment group) or being directly assigned to a course (control group). Finally, we end up with a sample of 1,071 voucher recipients who started a training course in January or February 2003 and 12,077 direct assigned training participants.

In Table 1 we present summary statistics for various characteristics of treated and

¹²Individual data records are collected from the Integrated Employment Biographies (IEB). The IEB is a merged data file containing individual data records collected in four different administrative processes. The version of the IEB we use in this project, has been supplemented with personal and regional information not available in the standard version.

¹³Entering unemployment is defined as the transition from (non-subsidized, non-marginal, non-seasonal) employment to non-employment of at least one month plus subsequently (not necessarily immediately) some contact with the employment agency either through benefit receipt, program participation, or a job search spell. Subsidized employment refers to employment in the context of an ALMP. Marginal employment refers to employment of a few hours per week. This is due to specific social security regulations in Germany.

Table 1: Sample first moments of observed characteristics.

	Direct Assigned Training Participants	Training Participants with Training Vouchers	SD between (1) and (2)
	(1)	(2)	
Personal Characteristics			
Female	0.452	0.373	16.023
Age	38.751	37.961	10.574
Older than 50 years	0.014	0.007	6.212
No German citizenship	0.062	0.076	5.541
Children under 3 years	0.043	0.051	4.112
Single	0.276	0.320	9.708
Health problems	0.094	0.118	7.597
Sanction	0.009	0.012	2.563
Incapacity (e.g. illness, pregnancy)	0.155	0.162	1.895
Lack of Motivation	0.097	0.116	6.147
Education, Occupation and Sector			
No schooling degree	0.043	0.039	1.775
Schooling degree without Abitur	0.366	0.320	9.675
University entry degree (Abitur)	0.202	0.232	7.057
No vocational degree	0.201	0.210	2.199
Academic degree	0.100	0.091	3.240
White-collar	0.430	0.486	11.295
Elementary occupation	0.075	0.106	11.009
Skilled agriculture and fishery workers	0.012	0.011	0.474
Craft, machine operators and related	0.315	0.345	6.386
Clerks	0.251	0.221	7.024
Technicians and associate professionals	0.140	0.133	2.037
Professionals and managers	0.102	0.092	3.567
Employment and Welfare History			
Half months employed in the last 24 months	43.440	43.533	1.201
Half months unemployed in the last 24 months	0.839	0.917	3.231
Time since last unemployment in the last 24 months (half months)	44.762	44.776	0.194
No unemployment in last 24 months	0.815	0.802	3.301
Unemployed 24 months before	0.091	0.087	1.531
# unemployment spells in the last 24 months	0.246	0.272	4.254
Any program in last 24 months	0.082	0.088	2.082
Time of last out of labor force in last 24 months	44.110	44.415	3.791
Remaining unemployment insurance claim	23.515	24.504	7.971
Eligibility unemployment benefits	12.662	12.283	7.971
Cumulative employment (last 4 years before Unemployment)	75.959	75.289	2.804
Cumulative earnings (last 4 years before Unemployment)	80,496	80,231	0.588
Cumulative benefits (last 4 years before Unemployment)	4.905	5.704	7.633
State of Residence			
Baden-Württemberg	0.079	0.049	12.047
Bavaria	0.076	0.098	7.990
Berlin, Brandenburg	0.168	0.038	43.701
Hamburg, Mecklenburg Western Pomerania, Schleswig Holstein	0.091	0.033	24.369
Hesse	0.071	0.080	3.573
Northrhine-Westphalia	0.190	0.339	34.184
Rhineland Palatinate, Saarland	0.066	0.055	4.534
Saxony-Anhalt, Saxony, Thuringia	0.149	0.200	13.377
Regional Characteristics			
Share of employed in the production industry	0.232	0.253	25.860
Share of employed in the construction industry	0.068	0.067	3.267
Share of employed in the trade industry	0.150	0.152	10.636
Share of male unemployed	0.569	0.574	14.450
Share of non-German unemployed	0.131	0.132	1.632
Share of vacant fulltime jobs	0.796	0.796	0.093
Population per km^2	1,151	582	35.588
Unemployment rate	13.600	12.964	12.113

Note: In columns (1) and (2) we report the sample first moments of observed characteristics for the treated sub-samples. Information on individual characteristics refer to the time of inflow into unemployment, with the exception of the treatment months and the monthly regional labor market characteristics which refer to the treatment time. In column (3) we report the standardized differences between individuals who receive a training voucher and those who are directly assigned to training courses.

control persons. The share of female voucher recipients is with 37,3% remarkably lower than the share of direct assigned women. Unemployed who receive a training voucher in this time period are on average younger, more often white collar worker and were more often employed in elementary occupations. Regarding other characteristics and in particular with respect to the employment and welfare history there are only minor differences between the two groups. However, we observe differences in the regional distribution of treated and control persons. Large shares of voucher recipients live in the area of Northrhine-Westphalia and the northern part of West Germany.

4 The impact of expanded course choice

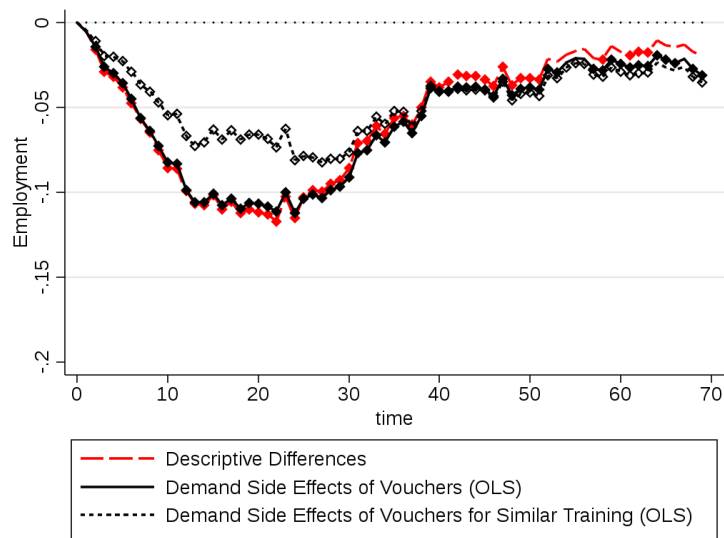
4.1 Preliminary results

The descriptive difference between the outcomes of voucher recipients and direct assigned unemployed are illustrated in Figure 1. The red dashed line reports the descriptive difference in employment probabilities and earnings between individuals participating in further training program with and without a voucher. The unconditional effects show up to 10 percentage points lower employment probabilities and 200 Euros lower monthly earnings during the first two years after the start of training. Even after almost six years (69 months), training participants with a voucher are worse off.

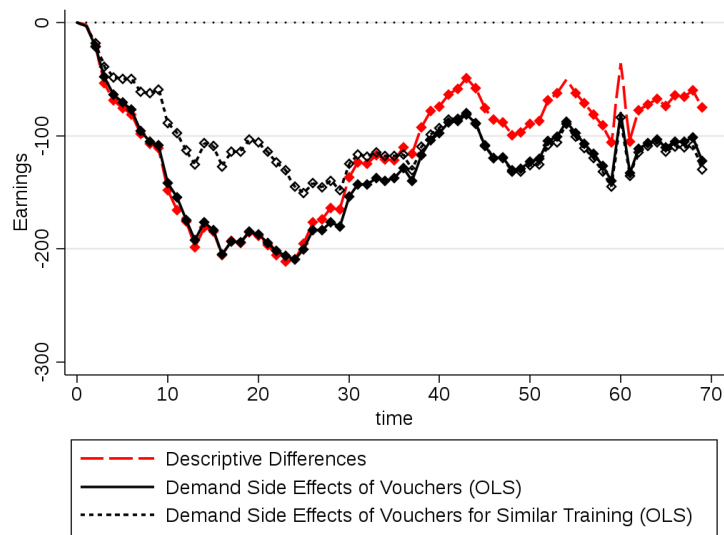
The black solid line in Figure 1 reports demand side effects of vouchers after controlling for a large set of control variables (all variables included in Table 1). The descriptive difference and the OLS estimates are surprisingly close to each other. This is partly reflected in Table 1, because of the small differences in the first moments of most control variables between training participants with and without a voucher. The demand side effects of vouchers are negative and statistically significant over almost the whole observation period.

As shown in Table 2, training programs and durations are not equally distributed between training participants with and without a voucher. We observe relatively less participants with vouchers in short and long training. The share of retraining programs is 15 percentage points higher for participants with a voucher. The type of training program is partly under the control of caseworkers, because they can indicate the objective and

Figure 1: Preliminary demand side effects of vouchers on employment probability and monthly earnings.



(a) Effects on employment



(b) Effects on monthly earnings (in Euro)

Note: We estimate separate effects for each of the 69 months following the treatment. Diamonds report significant point estimates at the 5%-level. Standard errors are bootstrapped with 1000 replications. In case we report lines without diamonds, the point estimates are not significantly different from zero.

the content of training on vouchers.¹⁴ For example, they can indicate that the course objective is to obtain a specific vocational degree. Such a voucher would offer the recipient to participate in a retraining program. On the other side, if caseworkers indicate on the voucher that the objective is to obtain a forklift license, then the unemployed probably

¹⁴Caseworkers have strategic reasons to award vouchers with short durations to individuals with good labor market opportunities (see discussion in Doerr and Strittmatter, 2013).

Table 2: Program composition and average durations by training types.

Participants without Vouchers				
	Percent	Average Planned Duration	Average Observed Duration	Difference
Practice Firms	20%	170 days	160 days	-10 days
Short Training	33%	133 days	116 days	-17 days
Long Training	31%	297 days	295 days	-2 days
Retraining	14%	703 days	648 days	-55 days
Others	14%	703 days	648 days	-55 days
Participants with Vouchers				
	Percent	Average Maximum Duration	Average Observed Duration	Difference
Practice Firms	18%	181 days	171 days	-10 days
Short Training	19%	147 days	123 days	-24 days
Long Training	24%	302 days	298 days	-4 days
Retraining	29%	737 days	695 days	-42 days
Others	14%	703 days	648 days	-55 days

take part in a short training program, which last for less than 6 months. Accordingly, the program type is not part of the choice set for voucher recipients.

Along the same lines, caseworkers can indicated the maximum duration of training programs on the voucher. Voucher recipients have the choice to participate in shorter programs, but cannot extend the maximum duration. In Table 2, we report the average observed durations of different training programs. In particular, practice firms and retraining programs have longer durations if the course is allocated through a voucher. Yet, these changes are very proportional to changes between the average planned and average maximum durations under the respective assignment mechanism. We argue that the training duration is mainly a decision of the caseworkers and is not really under the control of voucher recipients.

Following these arguments, we have to control for planned (or maximum) program durations and compositions, if we aim to reveal the pure demand side effects of vouchers. We can control for these characteristics, because they are determined on the day when the course is assigned or indicated on the voucher. Accordingly, these are valid pre-treatment control variables (comp. arguments in Lechner, Miquel, and Wunsch, 2011). The dashed black line in Figure 1 shows demand side effects of vouchers for similar training types. As

expected we find less negative effects during the lock-in period after we control for the differences in program type composition and durations. In the long run, training types are almost irrelevant.

Up to now, we allow for selection based on observed labor market characteristics. We find only little selection of training participants with vouchers. Caseworkers allocate vouchers which systematically allow for longer program durations than the programs which are directly assigned. This has negative lock-in effects on the return to training during the first two years. Yet, it could be that the selection of participants with vouchers is based on unobserved labor market characteristics. To address this issue, we implement an instrumental variable approach in the next section.

A second concern occurs with the presence of peer-group effects. For example, if unemployed participate in courses with higher motivation due to expanded choices, then this could also affect the peers within the course. If participants without vouchers benefit (suffer) from their peers, the estimates will be downward (upward) biased. The existing literature about classroom peers is mixed. Up-to-date studies find, if at all, only small impacts of peer-effects on students performance (see for example Angrist and Lang, 2004). Outcome measures in these studies focus in students performance, while they stay in school and have contact to their peers. In contrast, we focus on long-term labor market outcomes that are less likely to be influenced by peer-effects that may occur during course participation.

4.2 Exploiting the regional variation in voucher intensity as instrument

In order to identify the causal effect of expanded choice we exploit the regional variation in voucher intensity as instrument. The implementation of a voucher-like allocation system was not welcomed by all caseworkers in the employment offices. It is worth to mention that the authority and control of caseworkers regarding the allocation of training courses as well as the network to training providers was strongly diminished. As a result of the uncertainty and scepticism towards the new instrument the number of allocated vouchers varied strongly between employment offices. From 181 regional employment offices, 55 did not award a single voucher during the transition period.

The voucher ratio is defined as the number of training participants with a voucher divided by those without a voucher. It can be formalized by,

$$\gamma_j = \frac{v_j}{a_j}, \quad (1)$$

with $v_j = \sum_{i=1}^n d_j \cdot v_{ij}$ being the number of participants with a voucher in employment office j . The regional employment office is indicated by the Bernoulli d_j . The number of participants without a voucher are indicated by $a_j = \sum_{i=1}^n d_j \cdot a_{ij}$. We report the spatial distribution of the voucher ratio in Figure 2. This figure shows a map of Germany with its 181 regional employment offices. Light colored employment offices districts have a low voucher intensity and dark colored districts represent offices with a high voucher to direct assignment ratio. In white colored regions not one single voucher is awarded.

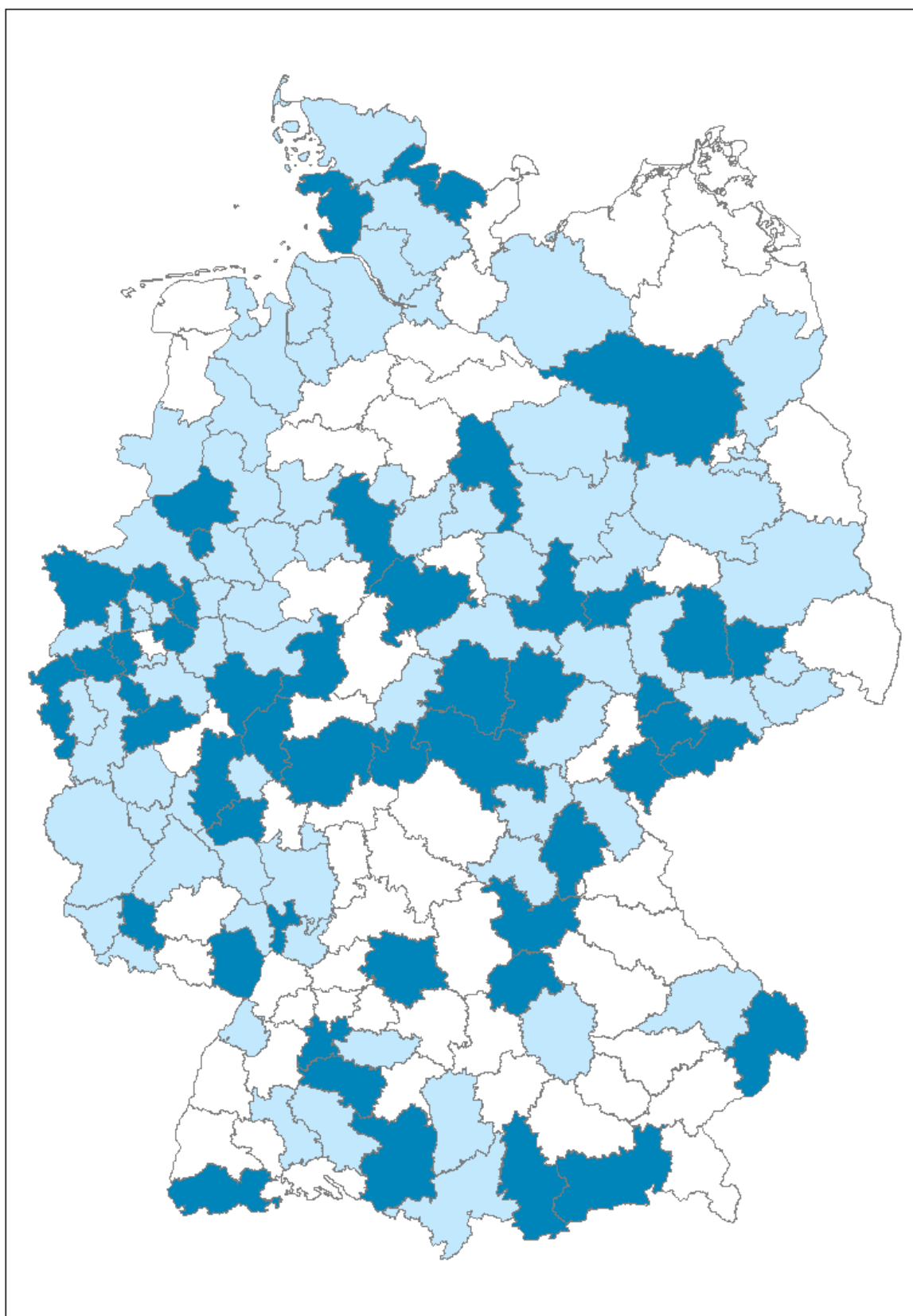
An appropriate instrument should influence the probability of being treated with a training voucher, without having a direct effect on the outcomes of interest. This leads to following binary instrument constructed on employment districts levels,

$$z_{ij} = I\{v_j > 0\}, \quad (2)$$

where $I\{\cdot\}$ is the indicator function. We assume that the expected labor market outcomes of participant i with (without) a voucher is not affected by the fact that he lives in a region j with $z_{ij} = 1$ or $z_{ij} = 0$, unless his assignment mechanism into training chances. The regional variation in the voucher ratio show no systematic pattern or regional clustering. In the first stage, we estimate the influence of the instrument on the probability to participate with a voucher, conditional on a rich set of observed characteristics. These control variables include individual as well as various regional labor market information (see Table 1). The instrument has very strong power (t-statistic = 17.48, F-statistic = 318.34).

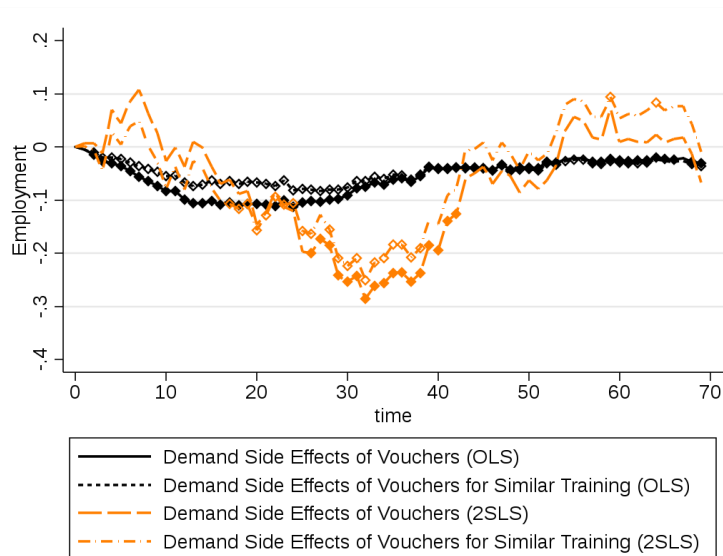
Our identification strategy identifies average treatment effects for the complier subpopulation (see LATE framework in Angrist, Imbens, and Rubin, 1996, Imbens and Angrist, 1994). The compliers are the subpopulation that reacts in a positive way to the instrument assignment. This means that they take the treatment if $z_{ij} = 1$ and do not take the treatment if $z_{ij} = 0$. Given that $v_i = 0$ if $z_{ij} = 0$, we have the special case of one-sided

Figure 2: Regional allocation of voucher intensities.

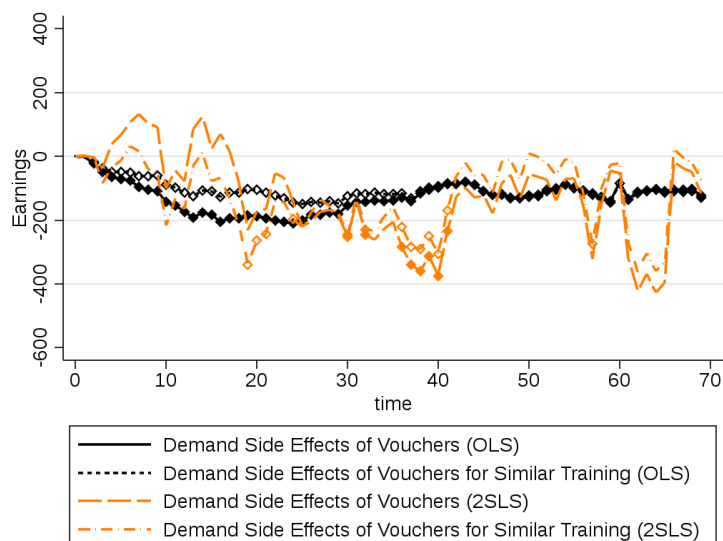


Note: The voucher intensity is calculated as ratio between the number of unemployed treated with a training voucher and the number of direct assigned unemployed within each employment office district j . White-coloured districts award zero vouchers, thus $\gamma_j = 0$. Light-blue coloured offices have an ratio lower or equal $0 < \gamma_j \leq 0.17$ (75% quartil). Dark-blue coloured offices have very high voucher intensities ($\gamma_j > 0.17$).

Figure 3: Demand side effects of vouchers on employment probability and monthly earnings.



(a) Effects on employment



(b) Effects on monthly earnings (in Euro)

Note: We estimate separate effects for each of the 69 months following the treatment. Diamonds report significant point estimates at the 5%-level. Standard errors are bootstrapped with 1000 replications. In case we report lines without diamonds, the point estimates are not significantly different from zero.

non-compliance (Angrist and Pischke, 2009, Frölich and Melly, 2013). This implies that we only observe $v_i = 1$ if $z_{ij} = 1$. Accordingly, the complier subpopulation coincides with the treated subpopulation. Following these arguments, this identification strategy allows us to identify average treatment effects on the treated.

The 2SLS estimates are presented in Figure 3 as monthly effects and in Table 3 as

Table 3: Yearly demand side effects of vouchers for OLS and 2SLS regressions on employment probability and monthly earnings.

	Employment				Earnings			
	OLS		2SLS		OLS		2SLS	
1st Year	-0.052***	(0.007)	0.028	(0.053)	-90.567***	(14.487)	23.122	(120.092)
2nd Year	-0.108***	(0.012)	-0.076	(0.089)	-197.029***	(25.933)	-49.699	(195.999)
3rd Year	-0.085***	(0.014)	-0.230***	(0.093)	-161.638***	(29.567)	-213.645	(199.319)
4th Year	-0.044***	(0.014)	-0.121	(0.091)	-110.553***	(30.487)	-201.312	(199.463)
5th Year	-0.030***	(0.014)	-0.006	(0.090)	-115.369***	(31.589)	-110.821	(210.901)
6th year	-0.027***	(0.014)	0.002	(0.089)	-115.011***	(32.399)	-238.989	(282.950)
Overall period	-0.059***	(0.009)	-0.070	(0.066)	-132.420***	(21.981)	-127.234	(163.214)
Conditional on program types and durations								
	OLS		2SLS		OLS		2SLS	
1st Year	-0.034***	(0.006)	-0.017	(0.050)	-58.969***	(13.890)	-75.981	(114.588)
2nd Year	-0.070***	(0.011)	-0.128	(0.083)	-120.525***	(24.385)	-165.372	(185.876)
3rd Year	-0.070***	(0.013)	-0.234***	(0.091)	-131.569***	(29.174)	-233.491	(194.403)
4th Year	-0.045***	(0.014)	-0.119	(0.090)	-107.931***	(30.645)	-200.645	(196.794)
5th Year	-0.034***	(0.014)	0.001	(0.089)	-119.234***	(31.933)	-102.881	(208.154)
6th year	-0.031***	(0.014)	0.015	(0.088)	-119.420***	(32.704)	-219.819	(281.261)
Overall period	-0.048***	(0.009)	-0.085	(0.065)	-109.182***	(21.829)	-164.041	(159.822)

Note: In the last year we observe individuals up to 9 months. The whole observational period is 5 years and 9 months long. We bootstrap standard errors with 1000 replications.

averaged yearly effects over the whole observation period. The estimates show very imprecise effects of expanded choice on employment probability and monthly earnings. We find a strong negative effect in the third year after program start that reduce the employment probability about 23% percentage points. The effects on earnings are estimated with high standard errors. The results are robust when we condition on the program composition and duration.

As discussed earlier, expanded choice can influence later labor market outcomes due to better matches between training participants and courses and/or higher motivated individuals. Unfortunately, we cannot identify individuals who participate in exactly the same course. Nevertheless, it is interesting to see whether expanded choices lead to heterogenous effects by program type. In Figure 4 in the appendix, we plot the survival rates in different programs for voucher recipients and direct assigned participants. For practice firm training, classical short and long training programs the survival rates are very similar. The survival rate of participants in retraining is remarkably higher during the first two years after program start if a voucher is awarded.

In Table 4 we report effect heterogeneity by program types. The 2SLS estimates

Table 4: Heterogenous effects by program type conditional on the planned program duration on employment probability and and monthly earnings.

	Practice Firms		Short Training		Long Training		Retraining	
	Employment (2SLS)							
1st Year	0.036	(0.118)	-0.051	(0.118)	0.068	(0.108)	-0.057	(0.039)
2nd Year	0.039	(0.183)	-0.131	(0.166)	-0.328	(0.229)	-0.102	(0.072)
3rd Year	0.140	(0.187)	-0.394***	(0.174)	-0.291	(0.246)	-0.235***	(0.123)
4th Year	-0.100	(0.191)	-0.136	(0.171)	-0.050	(0.254)	-0.083	(0.135)
5th Year	0.055	(0.189)	-0.010	(0.167)	0.022	(0.252)	-0.034	(0.141)
6th year	0.043	(0.195)	-0.062	(0.170)	0.101	(0.247)	0.024	(0.137)
Overall Period	0.035	(0.143)	-0.134	(0.128)	-0.088	(0.177)	-0.086	(0.079)
	Earnings (2SLS)							
1st Year	28.784	(253.814)	-223.489	(251.257)	253.007	(270.482)	-107.931	(94.923)
2nd Year	243.440	(381.353)	-777.413***	(365.102)	292.235	(550.956)	-57.907	(125.171)
3rd Year	173.908	(393.731)	-666.890*	(377.365)	76.580	(581.921)	-145.794	(239.822)
4th Year	-310.508	(403.916)	-503.976	(376.446)	409.218	(614.729)	-57.520	(269.959)
5th Year	-43.332	(408.238)	-385.085	(386.016)	346.722	(624.833)	-29.937	(294.016)
6th year	114.747	(421.069)	-1111.361	(728.960)	437.157	(645.755)	-89.903	(294.886)
Overall Period	31.018	(330.221)	-589.631	(319.012)	296.632	(463.540)	-81.133	(166.951)

Note: In the last year we observe individuals up to 9 months. The whole observational period is 5 years and 9 months long. We bootstrap standard errors with 1000 replications.

Table 5: 2SLS regressions for heterogenous effects by unemployment duration on employment probability and and monthly earnings.

	Short-Term Unemployed		Long-Term Unemployed		Short-Term Unemployed		Long-Term Unemployed	
	Employment				Earnings			
1st Year	0.004	(0.063)	-0.055	(0.085)	-67.549	(140.711)	-91.108	(184.129)
2nd Year	-0.167*	(0.101)	-0.023	(0.139)	-228.501	(229.307)	-11.892	(296.532)
3rd Year	-0.326***	(0.111)	-0.017	(0.159)	-265.929	(238.829)	-175.823	(333.747)
4th Year	-0.169	(0.113)	0.025	(0.169)	-184.194	(242.710)	-183.642	(357.575)
5th Year	-0.025	(0.111)	0.082	(0.168)	-44.381	(251.354)	-158.553	(360.174)
6th year	0.007	(0.115)	0.049	(0.169)	-77.260	(350.541)	-462.983	(364.279)
Overall period	-0.118	(0.081)	0.008	(0.118)	-147.565	(193.307)	-168.392	(264.343)

Note: In the last year we observe individuals up to 9 months. The whole observational period is 5 years and 9 months long. We bootstrap standard errors with 1000 replications.

are very imprecise and have high standard errors. Nevertheless, the effects of expanded choice for are negative significant for classical short training programs and retraining. One possible explanation for these negative findings is information failure. This support the argument that caseworkers do a better job in finding good matches than the unemployed itself. We find weak evidence that choices increase the effectiveness of practice firm programs. In addition, we estimate heterogenous effects for short-, and long-term unemployed (see Table 5). We find significant negative effects for short-term unemployed

within the second and third year after course start. The effects for long-term unemployed are not significantly different from zero.

5 Conclusion

In this paper, we investigate the impact of expanded choices on the returns to further training. Since January 2003, the former assignment system in which caseworkers assign unemployed individuals directly into training courses was replaced by training vouchers. We exploit the quasi-experimental setting during the transition period. This unique institutional setup allows us to identify voucher treated and direct assigned individuals during the same time in similar courses. To overcome selection issues that may bias the obtained estimates, we rely on exogenous variation in the regional voucher intensity between employment offices as an instrument. The presented 2SLS results are estimated with large standard errors. If at all, we find a negative impact on the employment probability and earnings within the medium term after treatment start. This supports arguments against vouchers as an instrument to assign further training due to information asymmetry and information failure. We find heterogeneous effects by program types and unemployment durations. Accordingly, participants in short training and retraining courses as well as short-term unemployed suffer most from being awarded with a training voucher instead of being directly assigned to a course.

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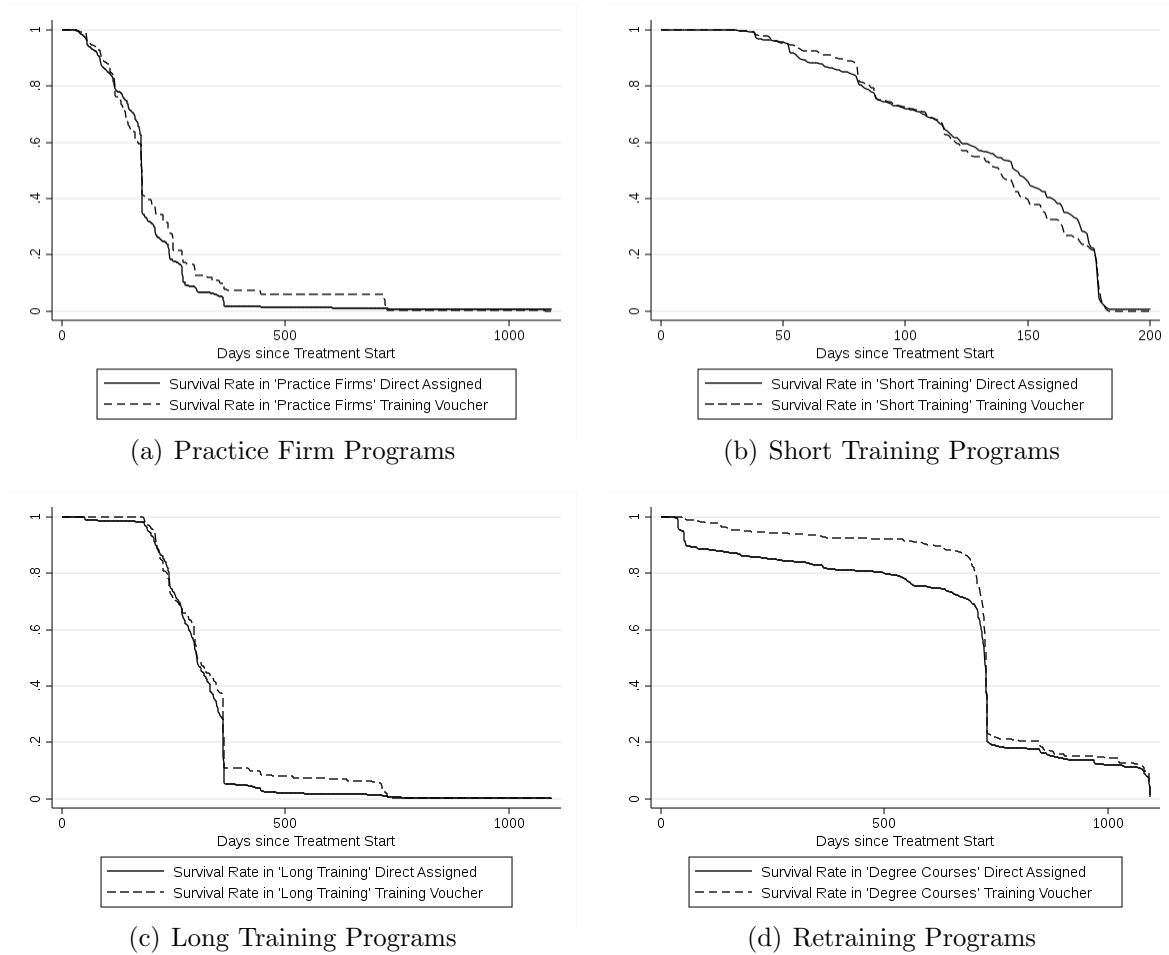
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Appendix

Figure 4: Survival rates in training programs for different program types before and after the reform.



We report the share of participants who actually survive in training. We use the baseline Sample A.