

KIDS OR COURSES?

GENDER DIFFERENCES IN THE EFFECTS OF ACTIVE LABOR MARKET POLICIES

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Abstract

This paper investigates active labor market programs in Austria with a special emphasis on male-female effect heterogeneity. On average, we find only small effects, if any, for most of the programs. A crucial advantage of the large and informative administrative data we use is that it provides records about pregnancies and times of parental leave, in addition to the information that can typically be found in European administrative data sources used for evaluating active labour market policies. We show that these variables play a key role in removing selection bias and defining outcome variables which may explain why other similar studies found such programs to be more effective for women than for men. In particular for younger women a key effect of the programs is to reduce or postpone pregnancies and to increase the attachment to the labor force. After taking into account gender specific selection effects and the effects of the programs on pregnancies, gender differences (almost) disappear.

Keywords: Active Labor market policy, matching estimation, program evaluation, panel data.

JEL classification: J68

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1 Introduction

There seems to be some consensus emerging that women benefit more from European labor market programs than men (e.g. see the survey by Bergemann and van den Berg, 2006). Our comprehensive evaluation of the Austrian active labor market programs shows that the effect differential disappears once information on pregnancies and parental leave is incorporated. This is particularly bad news in this specific case, since the programs appear to be ineffective for men.

Many recent European studies have emphasized the role of effect heterogeneity on the program level.¹ In terms of participant heterogeneity Puhani (1999) and Kluve, Lehmann, and Schmidt (1999, 2004) find sex specific program effects for Poland. Friedlander, Greenberg, and Robins (1997) and Heckman, LaLonde, and Smith (1999) feature sex differences for the US and other western economies. Lechner, Miquel, and Wunsch (2004) look at employment effects for certain subgroups of participants in West Germany. They find effect heterogeneity with respect to residence, previous occupation, and sex. For East Germany, Lechner, Miquel, and Wunsch (2008) find that for some training programs women had much larger employment effects than men. They attributed this heterogeneity to specifics of the selection process that resulted in a higher probability of men being trained with skills for the construction sector which then collapsed later. However, such a precise identification of the reason of gender differences is not always possible and the puzzle remains in many other studies. Bergemann and van den Berg (2006) survey the existing literature on effect differentials for men and

¹ For job creation schemes in Switzerland see Gerfin and Lechner (2002). Similar results appear in Lechner and Wunsch (2006) and in Caliendo, Hujer, and Thomson (2004, 2006a,b) for Germany. For wage or integration subsidies in Sweden see Sianesi (2002) and Forslund, Johannson, and Lindqvist (2004) and for Switzerland in Lalive, van Ours, and Zweimüller (2002) and Gerfin, Lechner, and Steiger (2005). For business start-up programs in Sweden, we refer to Carling and Gustafson (1999). For training measures, comprising formal qualification, further training of any kind, and retraining see Richardson and van den Berg (2001) and Carling and Richardson (2004) for Sweden, and Gerfin and Lechner (2002) and Hujer, Thomsen, and Zeiss (2005) for Switzerland and Germany. Lechner, Miquel, and Wunsch (2004) investigate long-run effects for Germany. Winter-Ebmer and Zweimüller (1996), Hofer and Weber (2004a, b), and Lutz, Mahringer, and Pöschl (2005) investigate employment effects for different instruments of the Austrian ALMP.

women in Europe. The key arguments that are put forward in many studies are gender differences with respect to labor supply elasticity, eagerness to learn, responsiveness to wage changes, and with respect to the larger choice set for women, i.e. including times of parental leave in addition to work and leisure. Their overall conclusion is that labor market programs seem to work better for women in countries where the female labor force participation rate is relatively small, which is also the case in Austria.

Due to a unique and informative data base of the Austrian labor force, we show that those estimated differential between men and women consist probably of two components. The first component is a selection bias due to the lack of controlling for the occurrence of pregnancies before or at the start of the programs, leading to more pregnancies in the group of nonparticipants than in the group of participants. Thus, estimated effects that ignore this information show bias in favor of the programs. Second, the remaining differential in the employment effect appears because program participation decreases or postpones fertility. Once those two components are accounted for, the effect heterogeneity between men and women disappears. Thus, linking our findings to Bergemann and van den Berg (2006), we demonstrate that in countries like Austria with a low female labor force participation rate,² it is even more important to have information about the outside opportunities of women, in particular times of parental leave.

The underlying data are made available by the Federation of Austrian Social Insurance Institutions and the Austrian Public Employment Service. We possess a rich set of information on the employment history, times of unemployment, the counseling process, personal characteristics, parental leaves, and times of program participation as well as regional characteristics. Assuming conditional independence of the selection mechanism and potential outcomes, we employ an advanced version of a semi-parametric matching estimator that is very popular in

the policy evaluation literature and was used previously, for instance, by Lechner, Miquel, and Wunsch (2004).

The paper is organized as follows. Section 2 briefly summarizes the institutional background of the Austrian labor market policy. Section 3 introduces the underlying data and identification strategy as well as a first description of the population of interest. The estimation method and first results of the program allocation analysis can be found in Section 4. Section 5 shows estimation results and omitted variable checks and Section 6 concludes. Details concerning the data, the estimation method, and results are provided in an internet appendix that can be downloaded from www.siaaw/lechner/at.

2 Labor Market Policies in Austria

The Public Employment Service Act constitutes the legal foundation of the Austrian labor market policy. It determines the objectives of the Public Employment Service by defining the following six principles. (i) The Public Employment Service has to match job seekers and vacancies efficiently, (ii) remove any barrier that prevents this matching, (iii) increase the flow of information about potential matches, (iv) mitigate quantitative and qualitative differences between labor demand and supply, (v) stabilize existing jobs, (vi) and provide funds for the unemployed in case of a job loss. As many other countries, Austria uses active and passive labor market policies to implement those principles.

2.1 Passive labor market policy

Passive labor market policy in Austria is designed to cover earnings losses caused by various types of non-employment. To receive unemployment benefit payments the unemployed have to be registered at the Public Employment Service, be eligible and willing to work, and have a

² Bergemann and van den Berg (2006) classify countries to have a low female labor force participation rate if it is at least 10 percent lower than the male labor force participation rate, which is the case for Austria in 1994 and 2004.

predefined record of employment with unemployment insurance contributions. The pre-unemployment employment requirement is a cumulated unemployment insurance contribution period of 52 weeks within the last 24 months for the first draw on benefits. Subsequent benefits require 28 weeks within the previous 12 months. Exceptions regarding age exist.³ The standard replacement ratio is 55 percent of the former net income and the minimum entitlement period is 20 weeks. Extra payments depending on family status and the number of children may be added. After unemployment benefits expire, the unemployed are entitled to unemployment assistance, if they are still available for work. Unemployment assistance payments are means-tested, but are not subject to a time limit.

2.2 Parental leave subsidies

There are three different types of subsidies for women in parental leave. Eight weeks before and after the scheduled confinement women receive so-called *confinement benefits*, which are granted up to the average net wage of the previous three months.⁴ After the expiration of those benefits (and before January 2002), women had to apply for parental leave benefits. This benefit was granted subject to the same requirements as unemployment benefit, which excluded women who failed to prove the required previous contribution times.⁵ After January 2002, women may apply for childcare benefit which is no longer linked to previous contribution times and granted to everyone with an amount of currently 14.53 Euro a day for a maximum period of 30 months.⁶ 18 months of this entitlement period are counted as regular contribution times to the pension schemes. All periods in which one of those three benefits is

³ The UB claim, for instance, for a 40 year old unemployed person, who paid UI contributions for 312 weeks in the last 120 months, is 39 weeks. See the internet appendix for a summary table of the various exceptions.

⁴ Unemployed receive a fixed quota of currently 7.42 Euros a day. Multiple births prolong the period after confinement to 12 weeks.

⁵ The default entitlement period was 549 days, which could be prolonged between July 2001 and December 2002 to provide a gradual adjustment to the childcare benefit regulations.

⁶ If the parents share child care times, the maximum entitlement period is prolonged to 36 months. If they fail to prove regular medical consultations, childcare benefits are reduced to 7.27 Euros per day. Extra earnings are allowed up to a maximum of 14.600 Euros per year.

received are recorded in the social security records. Therefore, this information is available in the current study.

2.3 Active labor market policy

Apart from counseling and placement services there are a variety of active labor market programs offered by the Public Employment Service in order to overcome specific reintegration obstacles of the unemployed.

The first group of programs promotes vocational mobility. Those programs can be classified into *orientation measures*, *active job search*, *job coaching*, and *qualification measures*. Orientation measures assess the individual situation and aptitude of the unemployed person and serve as an upfront decision process for subsequent (re-)integration activities. Active job search aims at improving job acquisition skills, like writing an application, or interview training. Job coaching deals with the long-term unemployed and groups with specific placement handicaps, like disabled persons, by a combination of counseling, qualification, and on the job training. Qualification measures comprise further education and various forms of vocational training. The range of program stretches from courses requiring only basic skill levels, like catering courses, to high level software courses, up to formal educational and vocational degrees. Participants are either allocated by the Public Employment Service or find a program on their own and then apply for course subsidies with the Public Employment Office.

Another group of programs consists of the so-called job creation schemes. *Socio-economic enterprises* and *non-profit sector projects* are designed to capture the long-term unemployed individuals and other problematic cases, like, for instance, individuals with psychological diseases, etc. Such programs offer a quasi-realistic work environment. In principle, those jobs are restricted to one year and sometimes accompanied by socio-pedagogical treatment to gradually reintegrate the participants into the regular labor market. With *integration subsidies*,

the Public Employment Service supports special groups of unemployed, like the disabled, long-term unemployed or older people, by means of a wage subsidy for the first 150 days of a new employment. Encouraging individuals to become self-employed, the Public Employment Service offers the so-called *business start-up program*, which supports participants beginning with a business idea until the actual foundation of their own firm. Furthermore, the Public Employment Service supports young individuals who have been searching unsuccessfully for an apprenticeship by providing different courses aimed at endowing the participants with human capital that is similar to the level of the first year of a regular apprenticeship of three years. A hybrid form of labor market programs is the so-called *beneficence for labor*, which is organized in collaboration with local firms in order to compensate sudden local excess demand or supply of workers caused by big business (plant) foundation or sudden plant closures.⁷ Finally, there are also qualification programs for employees to enhance sustainable employment for workers threatened by unemployment.

Table 1: Expenditures and number of participants by program type

Program	Partici-	Expen-	Exp. /	Partici-	Expen-	Exp. /	Partici-	Expen-	Exp. /	Exp.
	pation	ditures	Part.	pation	ditures	Part.	pation	ditures	Part.	per day
	2000			2001			2002			
Socio-economic enterprises	3.400	31	9.265	5.700	39	6.807	5.800	49	8.362	56
Non-profit sector projects	2.900	33	11.448	3.600	33	9.056	3.800	36	9.500	59
Orientation measures	8.000	28	3.511	11.800	29	2.451	18.200	28	1.535	19
Job coaching	1.700	10	5.915	2.700	11	4.180	4.100	10	2.447	18
Active job search	22.600	41	1.788	35.000	37	1.063	46.200	41	892	21
Qualification measures	77.700	110	1.411	65.600	104	1.591	54.400	123	2.262	29
Course subsidies	17.200	11	622	26.900	19	710	33.100	23	695	14
Business start-up program	11.900	31	2.613	22.300	32	1.448	34.300	34	980	8
Qualification programs for employees	7.600	18	2.316	27.200	28	1.044	44.300	35	763	17
Beneficence for labor	3.400	8	2.412	3.600	5	1.472	4.400	4	909	4
Integration subsidies	16.100	105	6.522	18.300	97	5.301	18.000	69	3.839	26
Overall expenditures for ALMP as a % of GDP										
0.52			0.5			0.56				

Note: Expenditures in million Euros. Expenditures per participation and per day are in Euros. The numbers in the participant-column denote cases not persons (multiple participations occur frequently). Sources: Basisinformationsbericht Österreich (2004), AMS Data Warehouse, OECD source data base.

⁷ In case of a business foundation future workers are trained with specific skills for the new firm. In case of a firm closure the dismissed are trained to adjust their skills for further employment in a new firm.

To get an impression of the magnitude of the programs, Table 1 reports the overall expenditures and number of participants per program type. It can be seen that active job search and qualification measures are the most important programs with respect to the number of participants. Over time, we observe that the number of active job search programs increases whereas participation in qualification measures drops to 70 percent in 2002 as compared to 2000. Integration subsidies features far less participants, but a considerable amount of expenditures since the respective subsidies can amount up to 100 percent of the wage bill of the new employment. The same holds for socio-economic enterprises and non-profit sector projects which are also characterized by high average costs per participation of, for instance, over 11'000 Euros for non-profit sector projects in 2000. In contrast, course subsidies appear to be on average a rather low-cost measure of around 600 Euros per participation in 2000.⁸ For the year 2002 we also calculated expenditures per day. Again, we can see that socio-economic enterprises, non-profit sector projects, and integration subsidies are the most expensive measures per day. The former two are even more costly since the respective expenditures do not only cover the wage of the participants, but also the coverage of potential losses of the job-creating firm. Beneficences for labor have very low costs per day since most of the costs are carried by the cooperating firms.

3. Data and identification strategy

3.1 Data

The three data sources that are used for the program evaluation comprise administrative registers from the Federation of Austrian Social Insurance Institutions, Austrian Public Employment Service, and the program register from the Public Employment Service. We make use of

⁸ For business start-up programs (BSU), qualification for employees (QFE), and integration subsidies (IS) we find decreasing costs per participation over time. BSU are less frequently accompanied by other courses. QFE measures are more and more redesigned into smaller specialized measures. The refund rate of IS, granted to the employers, decreases over time.

the Austrian population instead of a random sample as is usually the case. Using the population increases computation time considerably, but maximizes precision of our evaluation results. For example, due to the resulting large number of observations, it will be possible to non-parametrically estimate program effects fairly precise for various subgroups of participants and programs.

We use the Social Insurance data to obtain information about times in employment (employment states: employed, self-employed or civil servants; with earnings, and employer information), retirement, and other periods relevant for social insurance contributions from 1985 to 2005. Since all financial support during times of parental leave are granted relative to the scheduled confinement date, we are able to identify not only times of parental leave, but also the pregnancy status for women in the unemployment period under consideration, which will be a key conditioning variable in the analysis. Information about the counseling process of the Public Employment Service, i.e. beginning and end of an unemployment period, regional identifiers, personal characteristics like sex, marital status, nationality, current profession and desired profession, education, disability status, number of job offers received, or times of previous labor market program participation, is available from the Public Employment Service data from 1990 until 2005. Finally, the Public Employment Service data give us detailed information about the type of labor market program. From this source, we possess reliable participation information from 2000 to 2005.

Most of the data is available on a daily basis, but to condense the information into a manageable form we chose to aggregate the daily information into 2 week intervals (which is of course much more precise than the usual evaluation studies that are commonly based on monthly, quarterly or even yearly information).

However, although this data set is well suited for an evaluation exercise, the nature of the data nevertheless imposes some restrictions with respect to the definition of the participation win-

dow and the follow-up period which will be discussed in details later on. Furthermore, we have to rely on a quite broad definition of the type of qualification measures⁹.

3.2 Identification strategy

In the current analysis we concentrate on the average program effects compared to the state of non-participation. The identification problem in non-experimental program evaluations is that participants in one program differ, sometimes substantially, from potential comparison observations in the non-participation state with respect to characteristics that may influence the outcome variables under inspection as well. Since our data is very informative, but contains no obvious instrumental variable, i.e. a variable that influences the outcome only by the influencing participation decision, we chose the so-called conditional independence assumption (CIA) to overcome the resulting identification problem. It states that if we are able to observe all factors that jointly influence the participation decision and the outcomes, then, conditional on those factors, we can learn the (potential) non-participation outcomes of the participants from the observable non-participation outcomes of the non-participants with the same distribution of characteristics, which identifies our parameter of interest. This identification strategy goes back to Rubin (1974) for the case of comparing participants to nonparticipants. Imbens (2000) and Lechner (2001) generalize this idea to the case of multiple treatments and provide similar identification conditions. However, the CIA strongly hinges on the availability of a comprehensive set of covariates. To justify its applicability in the present framework, we now discuss three important issues of program allocation, the allocation decision of the caseworker of the Public Employment Service, the willingness and collaboration by the unemployed individual, as well as relevant eligibility criteria in general.

⁹ All variables that can potentially be used to further distinguish the wide range of qualification measures have bad filling degrees.

The standard allocation procedure is initially based on a face-to-face interview between the unemployed person and the caseworker. Several aspects, like education, family affairs, past medium-term behavior on the labor market, features of the last employment, and individual program history are discussed. As a result of this interview and in the light of the local characteristics of the labor market the caseworker decides whether or not the unemployed person should be sent into a specific labor market program. The available data contains a large set of covariates that are suitable to map most of those aspects. In addition to variables like age, sex, foreigner status, family status, education, information on the job and the previous sector of employment, we construct a rich set of variables that summarizes the entire labor market history of the unemployed person. This history covers up to 15 years before the actual entry into unemployment under inspection on a fine 2-week scale. We construct variables covering previous times of (un-)employment, program participation, times of childcare, military service, times of non-registration, which we call out-of-labor-force times (OLF) from now on, and the pregnancy status for women. In addition, we use characteristics of the local labor markets relevant for each specific individual.¹⁰

From the perspective of the unemployed, all points, mentioned above, certainly play a role for the participation decision. Another component of the individual consideration might be the question whether the currently unemployed person was satisfied with the kind of his/her former job. Since we observe data on the current and the desired profession, we are able to identify or at least approximate this feature. Furthermore, since unemployment insurance contributions are paid during times of program participation, the individual decision might take into account the remaining time of the unemployment benefits. Thus, we also compute the remaining unemployment benefits claim at the time of entry.

¹⁰ The local labor market data was provided by the Austrian Institute of Economic Research and is merged to the individual unemployed via regional identifiers of the local Public Employment Service office.

Finally, a key eligibility requirement for participation is being unemployed (whether the individual receives unemployment benefits or unemployment assistance is irrelevant). We will resolve this issue by choosing an adequate inflow of eligibles into unemployment. Overall, we conclude that we are able to pin down most important factors that drive the allocation decision and the potential outcomes. Thus, assuming CIA appears to be credible identification strategy.

3.3 Definition of the population and the programs of interest

To be included in our evaluation, programs and the respective participants have to meet five requirements. First, the identification strategy strongly hinges on the existence of a long labor market history before the entry into unemployment. Second, the follow-up period after program attendance should not be influenced by perturbing events like the possibility of (early) retirement. As a result of those arguments we concentrate on the age groups of the labor force between 25 and 50 years which allows us to obtain precise and convincing results. Third, the data must provide all relevant information about the selection into the different labor market programs. Fourth, since we employ non-parametric estimation techniques, the number of observations in the different programs has to be sufficiently large. Finally, we require the program content to be more substantial than the usual counseling process. Under those restrictions, we end up with six program types that can be credibly evaluated: Socio-economic enterprises, non-profit sector projects, job coaching, active job search, qualification measures, and course subsidies.

The nature of the data very much drives the definition of the population used in the estimation. Information on program participation is only available from the year 2000 onwards. The follow-up period is restricted by the end of the observation period in 2005. Hence, we consider the first inflow of individuals¹¹ from employment into unemployment or one of the six

¹¹ As in Lechner, Miquel, and Wunsch (2004, 2005).

labor market programs between 2000 and 2002.¹² By means of this, we observe enough participants in each program and have a follow-up period of at least three years, which enables us to identify effects that are less affected by initial lock-in effects. Doing so, we end up with a population of 797'034 persons, where only a small fraction of 0.6 percent enters into a program in the first two weeks of unemployment.

The next step is to divide all persons who passed this criterion into participants and nonparticipants. In that population we define a participant to be a person who took part in a program before the end of 2002 (without an employment spell between inflow and participation). Thus, nonparticipants are persons who moved from employment into unemployment and have not been allocated to a program between 2000 and 2002, or took up an employment before being allocated to a program. The resulting numbers of observations are shown in the first row of Table 2.

Table 2: Selection of the population used in the estimation

Nonparticipation	Socio-economic enterprises	Non-profit sector projects	Active job search	Job coaching	Qualification measures	Course subsidies
All persons who switch into unemployment for the first time between 2000 and 2002						
706'653	2'119	1'474	36'870	1'152	31'277	17'489
Simulated start date before the end of 2002 and in 'defining unemployment spell'						
289'629	2'119	1'474	36'870	1'152	31'277	17'489
No temporary layoffs*						
221'729	2'014	1'382	35'312	1'071	29'518	15'922
Age at entry between 25 and 50						
119'925	979	894	22'452	613	20'704	11'447
Duration of last employment > 2 months						
105'342	693	650	19'316	453	18'233	10'150

Note: * Without a fixed re-employment date.

However, we impose a number of further restrictions. Some control variables, like the remaining unemployment insurance benefit claim or the duration in unemployment before the entry into a program require a reference data (artificial program start date) for the nonparticipants. To obtain such a reference date, we employ an approach suggested by Lechner (1999).

¹² Denote this unemployment spell as the 'defining UE spell'.

We simulate start dates for the nonparticipants by drawing start dates from the distribution of the participants. If the nonparticipant is not eligible at the simulated reference date, then this nonparticipant is not considered in the evaluation. The fairly drastic reduction in the number of observations is not particularly important though, since (i) participants are in abundant supply, and (ii) they serve only as comparison observations for participants and are not interesting per se. In Austria, temporary layoffs are widely spread. Especially workers in the tourism or construction sector are laid off with a more or less binding reemployment guarantee. Since such reemployment guarantees may differ substantially with respect to how much binding they are, and since we do not observe such differences that most likely influence participation and labor market outcomes, we require that all persons are laid off permanently. The age restriction, for reasons described above, is applied as well. Furthermore, we require the duration of the last employment before the inflow into our sample to be longer than 2 months. By means of this, we make sure that prior participants in subsidized employment are not employed further for a couple of days after the end of the program which would cause a short employment spell before becoming unemployed again. We observe that especially the age restriction reduces the number of participants and nonparticipants considerably. The resulting number of observations, however, still allows reliable results from non-parametric estimation.

3.4 A descriptive analysis of the selection into the programs

As a first description of the selection process, Table 3 shows mean characteristics by participation status for selected variables.¹³ In general, the numbers exhibit many aspects of the institutional environment in Austria as well as the general allocation policy of the Public Employment Service. Except for socio-economic enterprises and active job search the fraction of

¹³ The entire set of variables that are used in the estimation part of this paper is available from the internet appendix. It covers personal characteristics, like family status, education, last profession, last industry sector, last firm size, last salary,

female participants is above 50 percent. Qualification measures even have a female participation rate of 62% which underlines gender mainstreaming requirements anchored in the Guiding Principles of the Federal Ministry of Economics and Labor. Consequently, those participants feature higher average mean durations in times of parental leave before the defining unemployment period. We computed the pregnancy state for women right before the hypothetical program start. It can be seen that pregnancy is hardly an issue for the program groups, except for non-profit sector projects. Further, we observe that the fraction of pregnant female non-participants is higher compared to female participants of all programs, so that pregnancy status is indeed an important variable to control for in the remainder of the analysis.

For programs specifically designed for unemployed with certain reintegration obstacles, like socio economic enterprises, non-profit sector projects and job coaching, we observe a fraction of disabled participants of almost 22 percent which is nearly three times higher than for active job search and more than two times higher than for qualification measures and course subsidies. Participants of socio economic enterprises are also on average the oldest and the ones with the shortest mean duration in childcare. This distinction between programs for unemployed with stronger reintegration problems on the one hand and programs for unemployed with 'usual' reintegration problems on the other hand can be observed in many dimensions. For the former group we observe predominantly participants with compulsory schooling (9 years) as the highest education level, jobs in the production and construction sector, higher average times in unemployment, shorter durations of the last employment spell and a lower overall fraction in employment over the entire observation period in the data. Furthermore, those participants have much lower remaining benefit claims at the time of program entry and lower past earnings.

remaining benefit duration at program entry, different aspects of the labor market history, and times of child care, program history and a set of regional indicators.

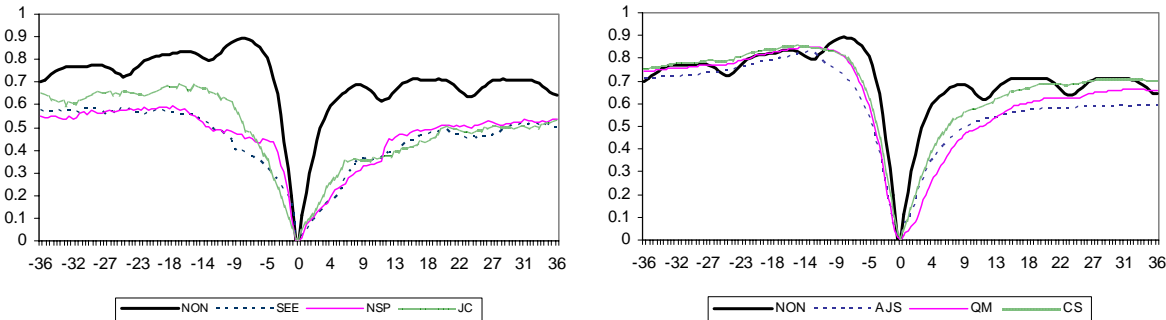
Table 3: Mean characteristics of selected variables (mean or share in %)

Variable	Non-participation	Socio-econ. enterprises	Non-profit sector projects	Active job search	Job coaching	Qualification measure	Course subsidies
Number of observations	105342	693	650	19316	453	18233	10150
Personal characteristics (in %)							
Female	51	49	54	50	54	62	55
Disabled	5	21	22	7	22	10	10
Foreigner	20	12	7	21	11	13	14
Age at (hyp.) program entry	36	40	37	37	37	37	37
Desires vocational change	18	26	21	29	23	22	20
Pregnant at the (hyp.) program start (only women subsample)*	2.5	0	1.7	0.3	0.4	0.5	0.5
Education (in %)							
No formal education	3	3	4	6	4	2	3
Compulsory school	34	50	40	35	46	28	26
Apprenticeship+	35	32	29	30	27	37	35
Schooling degree with vocational qualification	6	5	7	6	8	10	9
Schooling degree with university entrance qualification	9	4	7	11	4	12	12
Academic degree	5	.9	9	5	4	4	7
Education missing	8	4	4	8	6	8	8
Income (in EUR / day)							
Last earnings	42	38	34	45	37	43	43
Unemployment insurance benefit claim at (hyp.) program entry	22	10	10	17	11	19	19
Last employment (in months)							
Duration of last employment	28	20	20	28	23	32	33
Fractions of entire period in data (in %)							
Fraction of unemployment	12	22	21	14	18	12	11
Fraction of employment	68	59	53	67	60	67	68
Fraction of remaining time	20	19	27	19	22	21	22
Mean duration (in months)							
Employment over 5 years before	21	16	14	21	17	24	25
Out of labor force over 5 y. before	1.5	1.5	1.8	1.3	1.6	1.4	1.5
Child care over 5 years before	2.1	1.6	2.6	2.0	2.0	2.6	2.1
Program history (in %)							
Last program of the same kind	--	23	17	17	14	15	14
Information on current unemployment spell							
Entry 1 st quarter of the year (in %)	27	32	44	31	29	29	28
2 nd quarter (in %)	23	24	20	26	20	24	23
3 rd quarter (in %)	23	22	23	25	26	25	26
4 th quarter (in %)	28	22	13	19	25	22	24
Time in unemployment before (hyp.) program entry (in months)	3.1	7.8	6.3	5.7	7.5	4.9	4.9
Regional information (in %)							
UE rate 2000	7.0	6.7	6.9	8.5	6.2	7.2	6.7
Local fraction unemployment assistance recipients 2001	32	32	32	44	28	35	32
Local fraction of long-term unemployed 2000	20	19	20	29	15	22	19
Residence in the state of Vienna	23	17	5	65	7	30	23
Employment after begin of program (in %; outcome)							
Employed 1 year after begin	62	37	41	53	37	51	59
Employed 2 years after begin	64	45	50	58	47	62	68
Employed 3 years after begin	64	49	54	59	53	66	70

Note: If not stated otherwise, we compute all variables of the employment history at the entry into the defining unemployment spell. (*) Pregnancy is the only variable that is computed on the women's subsample.

A peculiarity that is observed for all program groups is that 15-23 percent of the participants attended a program of the same kind in a previous unemployment spell. Active job search measures, primarily used to endow participants with special job application and interview skills, are also used as a screening instrument for long-term unemployed in order to renew and tighten the contact to the local Public Employment Service office. This is also reflected in Table 3 since participants in active job search live in regions with a higher average fraction of long-term unemployment. It can be observed that non-profit sector projects and job coaching are rarely used in the state of Vienna compared to the rest of Austria. In terms of employment in the follow up period after the program we find that participants in socio-economic enterprises, non-profit sector projects and job coaching have considerably lower employment rates one year after the program start, which is not surprising given program lengths of up to one year. Participants in shorter programs exhibit higher employment rates. Overall, participants catch up after two or three years.

Figure 1: Employment 3 years before and after program entry



Note: NON: nonparticipation; SEE: socio-economic enterprises; NSP: non-profit sector projects; JC: job coaching; AJS: active job search; QM: qualification measure; CS: course subsidy.

Figure 1 provides a more complete picture of pre- and post-program employment rates. The abscissa shows the months before and after the start of the program. The ordinate measures the employment rate for different program groups. The left picture shows that participants in socio-economic enterprises, non-profit sector projects, and job coaching differ quite substantially from nonparticipants with respect to their employment histories three years before the

program. Hence, interpreting post-program employment rate differences as program effects is not appropriate. The same holds for active job search, qualification measures, and course subsidies. Here, the pre-program differences are clearly visible, but not as large as for the first group of programs.

4. Econometric methodology

As discussed before, the identification of the program effects hinges on the existence of the variables that jointly influence program participation and potential outcomes. For every comparison of different program states (including nonparticipation) the estimation strategy is to form comparison groups that do not differ from the respective program groups with respect to the distribution of those conditioning variables. We employ an advanced version of a semi-parametric two stage propensity score matching approach. This class of estimators is popular in the program evaluation literature, because it allows for individual effect heterogeneity while not requiring a parametric specification for the relation of the outcome variable and the variables used for the selection bias correction. Rosenbaum and Rubin (1983) show that if the CIA holds, given all relevant covariates, then it also holds for a scalar function of those covariates (balancing score property). Hence, a first-step procedure estimates conditional program participation probabilities (propensity scores). The advantage is that the construction of control groups can be done on the basis of the propensity score. Those points are discussed in Heckman, LaLonde, and Smith (1999) and Imbens (2004) for the binary treatment and in Imbens (2000) and Lechner (2001) for the multiple treatment case.

We model the propensity score for every comparison by means of binary probit models for men and women separately. The results give further insights into the program allocation of the caseworkers.¹⁴ Despite the existence of considerable heterogeneity, some general determinants

¹⁴ The entire set of estimation results for all different comparisons can be found in the internet appendix.

of program participation versus nonparticipation appear. For both sexes we find a positive relation of participation to disability, desiring a vocational change, longer durations of the defining unemployment spell, and having higher average durations in past employment. Jobs in the law and administration and trade sector tend to increase the probability of being promoted in active job search, qualification measures and course subsidies. Being a foreigner, having a university (entrance) degree, as well as a previous occupation in the service sector decreases (if at all) the participation probability. For women, we find that the months of pregnancy reduce the participation probability for all programs, except socio-economic enterprises. The overall previous time spent in parental leave prior to the defining unemployment spell under consideration reduces the participation probability for non-profit sector projects, job coaching, and active job search, but increases the one for course subsidies. For men, we find that having no vocational degree increases the probability of participating in socio-economic enterprises, non-profit sector projects, and active job search, but decreases the one for participating in course subsidies. The remaining picture is less clear-cut and summarized in Table 4.

To obtain the final estimates of the program effects, we use the extended propensity score matching procedure as proposed by Lechner, Miquel, and Wunsch (2004). First, they allow for more than one good match, if available, by incorporating the idea of caliper matching as in Dehejia and Wahba (2002). Second, they incorporate a bias correction procedure to account for small mismatches of the matching step by exploiting the double robustness property as discussed in Rubin (1979) and Joffe, et al. (2004). For more information on this approach and a detailed matching protocol see Lechner, Miquel, and Wunsch (2004).

Table 4: Results of the propensity score estimation

	All programs versus nonparticipation											
	Women						Men					
	Socio-economic enterprise (SEE)	Non-profit sector project (NSP)	Job coaching (JC)	Active job search (AJS)	Qualification measures (QM)	Course subsidy (CS)	Socio-economic enterprise (SEE)	Non-profit sector project (NSP)	Job coaching (JC)	Active job search (AJS)	Qualification measures (QM)	Course subsidy (CS)
Disabled	+	+	+	+	+	+	+	+	+	+	+	+
Foreigner									-	-		
Age at program entry				+		+		+	+	-	-	
No vocational degree	+			+	-	-	+		+	+		-
University entrance qualification and academic degree		-	-				-					
Wish for vocational change	+			+	+	+			+	+	+	+
Month of pregnancy		-	-	-	-	-						
Last earnings				+	-	+			-	-		
UB claim expired		+		-	-				-			
Duration of defining UE spell		+	+	+	+	+		+	+	+	+	+
Mean duration												
in employment 2 years before UE entry				+	+	+			+	+	+	+
in unemployment 2 years before UE entry				-	-	-			-	-	-	-
Overall time in child care		-	-	-	+	+						
Profession												
Agriculture				-				+				
law and administration				+	+	+			+	+	+	+
Engineering								+	+	+	+	+
schooling, health, culture	-			-	+	+						+
Commerce		-		+	+	+			+	+	+	+
Service		-		-	-	-			-	-	-	-
Regional indicators												
UE rate	-		+		-			+	-	-	-	-
fraction of long-term unemployed	+				+	+			-	+	+	+
industrial region	+	+			+	-			+			-
touristic region	+			+		-			+	+		-

Note: We estimate probit models for the selection into the different programs compared to the state of nonparticipation (the first six columns) and compared to participation in another program, but only within program group 1 and 2, respectively (last six columns). We do not report the value of the coefficients, since they are only identified up to scale and thus not comparable between the different models. + (-) denotes that the respective variable has a positive (negative) influence on the participation probability that is significant on the 5% level. **Reading example 1:** For the selection of women into job coaching (JC) compared to non-participation, we find a positive influence of the disability status on the probability of participating in JC. **Reading example 2:** For the selection of men into active job search (AJS) compared to non-participation, we find that the wish for a vocational change increases the probability of participating in AJS.

5. Results

5.1 Program effects by gender

The following figures illustrate program effects for participants in one program (listed at the top of each figure) compared to nonparticipation. The follow-up period relevant for outcome measurements starts at the day of program entry and ends three years later. Effects are estimated monthly as differences of percentage points for all outcome variables.¹⁵ If symbols appear on the different lines (denoting the program effects), it means that the respective effects are statistically different from zero at the 95 percent level. Recall that the matching step is done on the basis of propensity scores that are estimated for men and women separately.¹⁶

The two graphs in the first row of Figure 2 show employment effects of participating in socio-economic enterprises, non-profit sector projects, and job coaching. Common to all graphs of Figure 2 are negative employment effects for all programs right after the start, which is commonly labeled as lock-in effect (see van Ours 2004, among others). The intuition is that participants reduce their search intensity while being in a program and therefore re-enter less frequently into regular employment than non-participants. There are differences in the progression of the curves for men and women. For women, we observe that socio-economic enterprises seem to increase the employment probability of the participants by 9 percent after three years. For qualification measures and course subsidies, presented in the second panel of Figure 2, we find small positive effects at the very end of the follow-up period of about 2.5 percent for women.¹⁷ For male participants we do not find any positive effect for any programs. Qualification measures even seem to harm the respective participants three years after

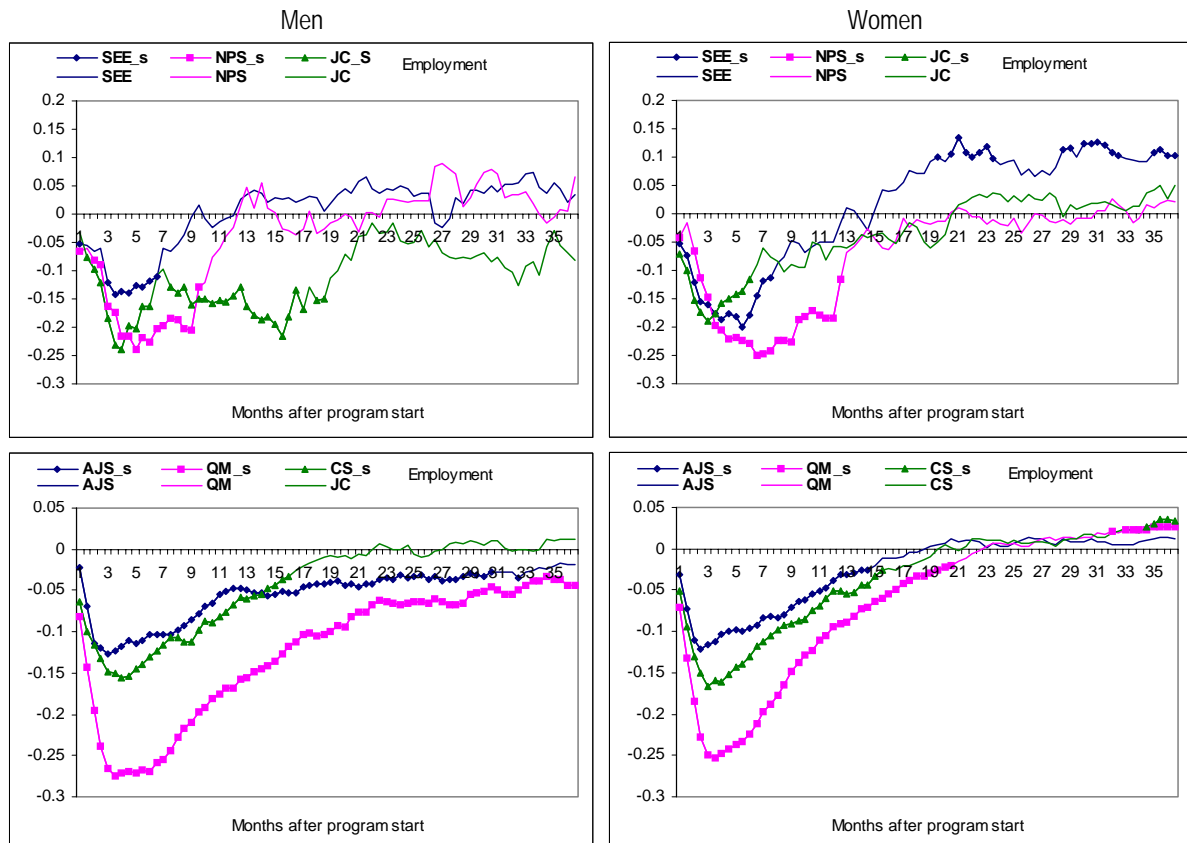
¹⁵ The outcome variable is also listed in the top line of every panel.

¹⁶ Note that we additionally deleted all individuals who received financial support right before the (hypothetical) entry into the program which had only marginal impact on the population size. See the internet appendix for details.

¹⁷ Note that it is possible to estimate fairly small effects (below 5 %-points) due to the larger number of participants in the programs collected in group two. Such small effects could not be identified non-parametrically before since comparable studies usually rely on (smaller) samples instead of using the population as is done here.

program start. So despite the generally negative picture about the effects of the Austrian active labor market policies, it seems at least that this study, so far, strengthens the argument that women tend to have an effect premium for certain labor market programs.¹⁸

Figure 2: Effects of program participation versus non-participation: Employment in %-points



Note: Results based on matching estimation. Abscissa: Months after program entry. Ordinate: Difference of employment rates. Symbols indicate that the effect is statistically different from zero at the 95% level. SEE: socio-economic enterprise, NSP: non-profit sector project, JC: job coaching, AJS: active job search, QM: qualification measure, CS: course subsidy. Participants (male/female): SEE (343/340), NSP (300/347), JC (206/243), AJS (9641/9638), QM (6869/11330), CS (4549/5587).

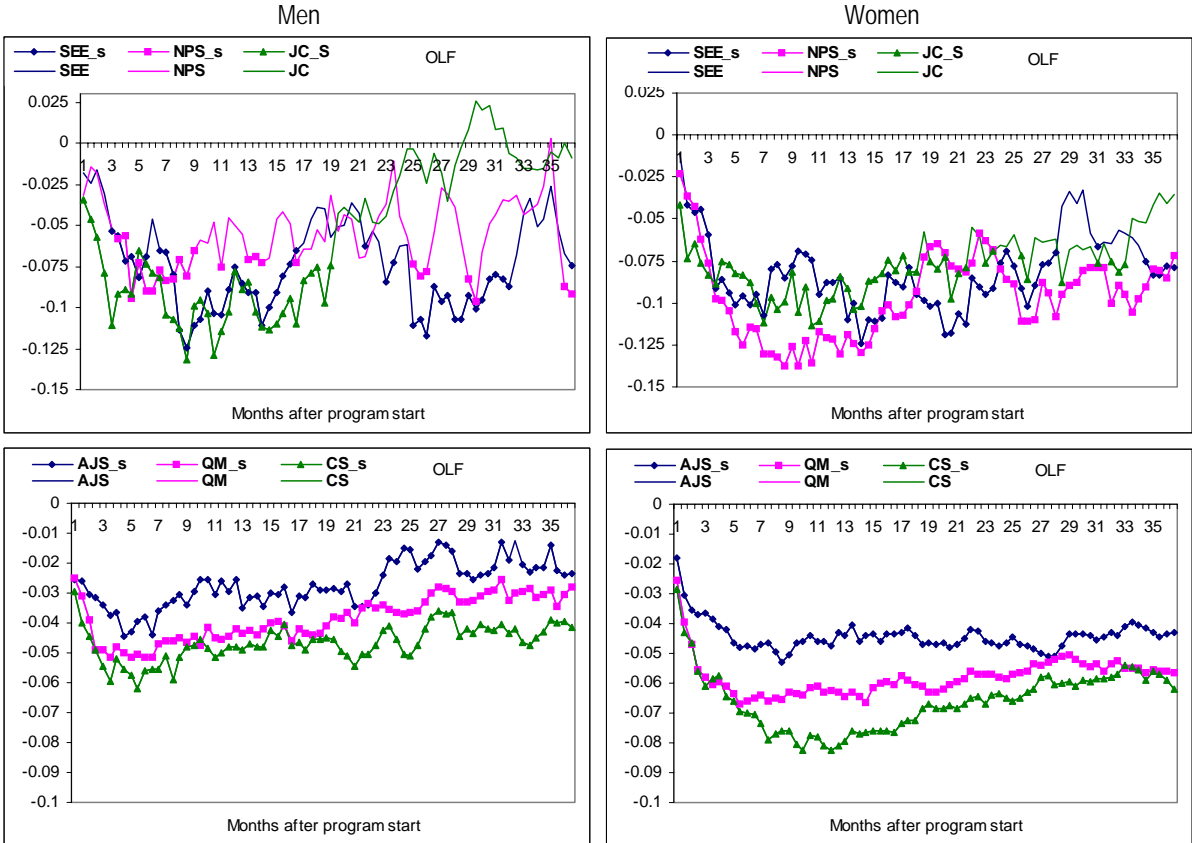
5.2 Where do the positive effects for women come from?

Previous studies, like Lechner, Miquel, and Wunsch (2004), showed that usually the positive employment effects are not achieved by reducing the rate of registered unemployed participants, but by increasing their labor force attachment, i.e. by reducing the rate of participants

¹⁸ Taking unemployment as the outcome variable, it can be seen for male participants that none of the programs decreases unemployment. Qualification measures even increase unemployment by 4 percent. For women only qualification measures and course subsidies decrease unemployment, but only by 1.5 to 2.5 percent. For further details see the internet appendix.

leaving the labor force. Therefore, Figure 3 shows the program effects on times out of the labor force (OLF), defined as not being employed and not being registered as unemployed) in the current study.

Figure 3: Effects of program participation versus non-participation: OLF (not employed & not registered as unemployed) in %-points

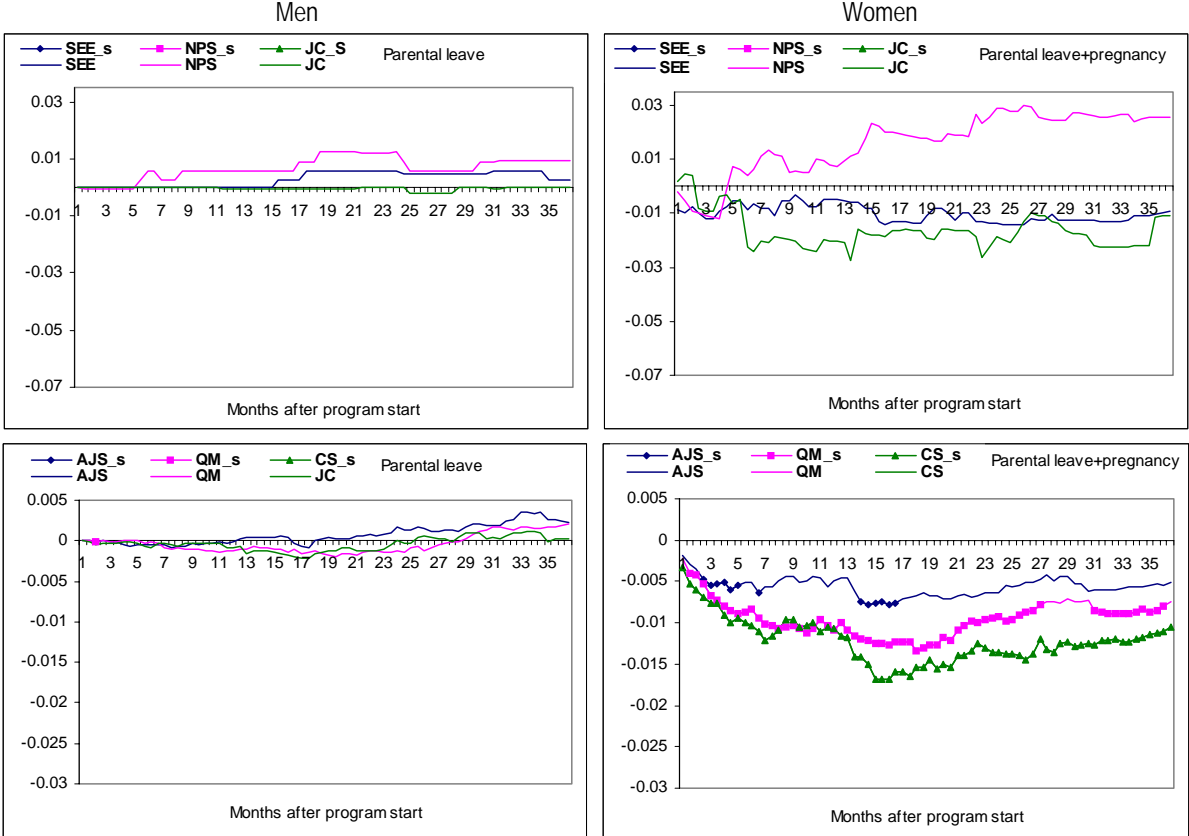


Note: Results based on matching estimation. Abscissa: Months after program entry. Ordinate: Difference of employment rates. Symbols indicate that the effect is statistically different from zero at the 95% level. SEE: socio-economic enterprise, NSP: non-profit sector project, JC: job coaching, AJS: active job search, QM: qualification measure, CS: course subsidy. Participants (male/female): SEE (343/340), NSP (300/347), JC (206/243), AJS (9641/9638), QM (6869/11330), CS (4549/5587).

All programs reduce times in OLF. Comparing both sexes, especially in the lower panel of Figure 3, we find the reduction of OLF to be higher for women than for men. Using a unique feature of our data, we disaggregate this effect further. Figure 4 shows the program effects on times of parental leave for men and on times of parental leave plus pregnancy (PP) for

women.¹⁹ For women, we find significant negative effects on PP for qualification measures and course subsidies.

Figure 4: Effects of program participation versus non-participation: Parental leave & pregnancy



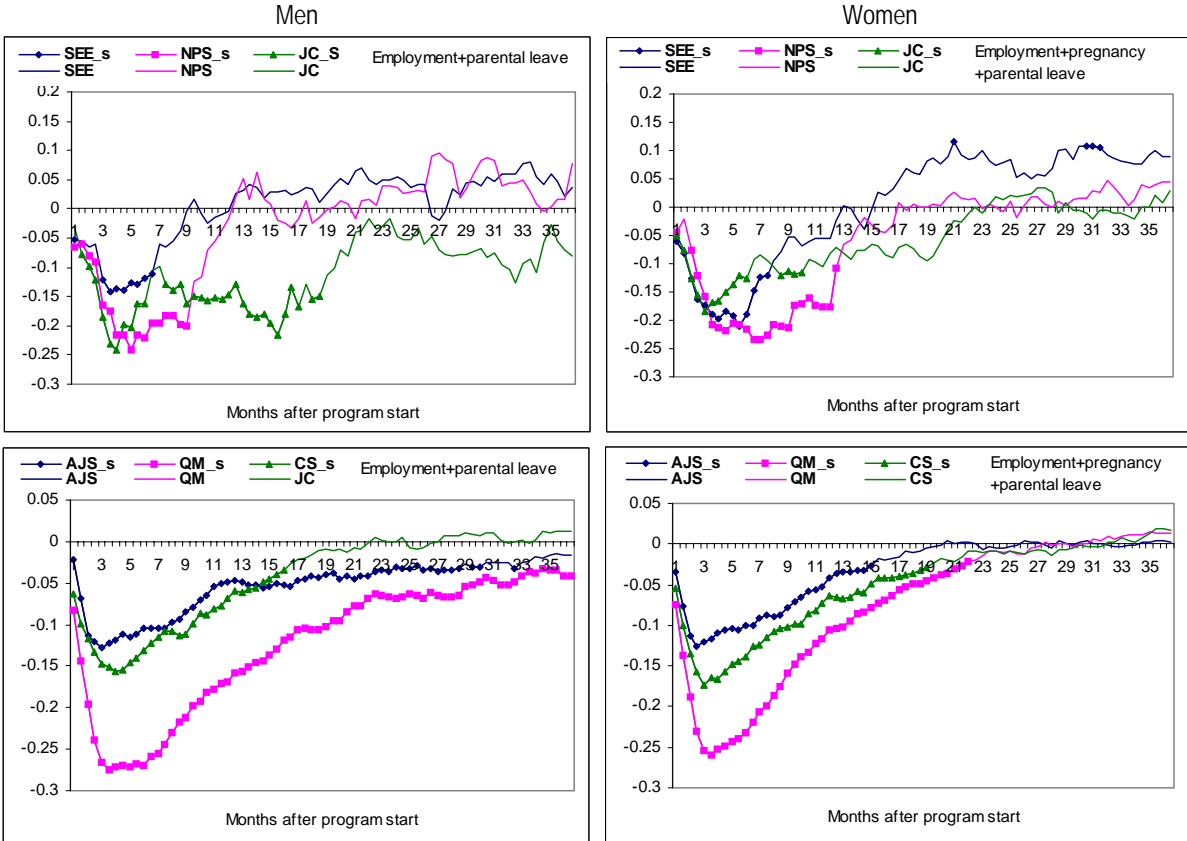
Note: Results based on matching estimation. Abscissa: Months after program entry. Ordinate: Difference of employment rates. Symbols indicate that the effect is statistically different from zero at the 95% level. SEE: socio-economic enterprise, NSP: non-profit sector project, JC: job coaching, AJS: active job search, QM: qualification measure, CS: course subsidy. Participants (male/female): SEE (343/340), NSP (300/347), JC (206/243), AJS (9641/9638), QM (6869/11330), CS (4549/5587).

For socio-economic enterprises, job coaching, and active job search we also find negative, but insignificant effects. Only non-profit sector projects seem to have small positive effects on PP, though being insignificant. There are no significant effects on parental leave for men. To summarize, women who are not allocated to a labor market program, though being eligible, switch more frequently into PP. It seems as if part of those women are faced implicitly with the decision of being trained or using the time to realize family plans that would have been

¹⁹ Women receive financial support eight weeks before a scheduled confinement and for up to 3 years afterwards, as described in Section 2. Since part of this period is counted as contribution times to the pension schemes, we observe them in the social security records.

postponed otherwise, i.e. in case of a program allocation. To test this argument, we use an outcome variable which takes the value one for times in employment *and* PP and zero otherwise. The results are presented in Figure 5.

Figure 5: Effects of program participation versus non-participation: Employment & pregnancy & parental leave



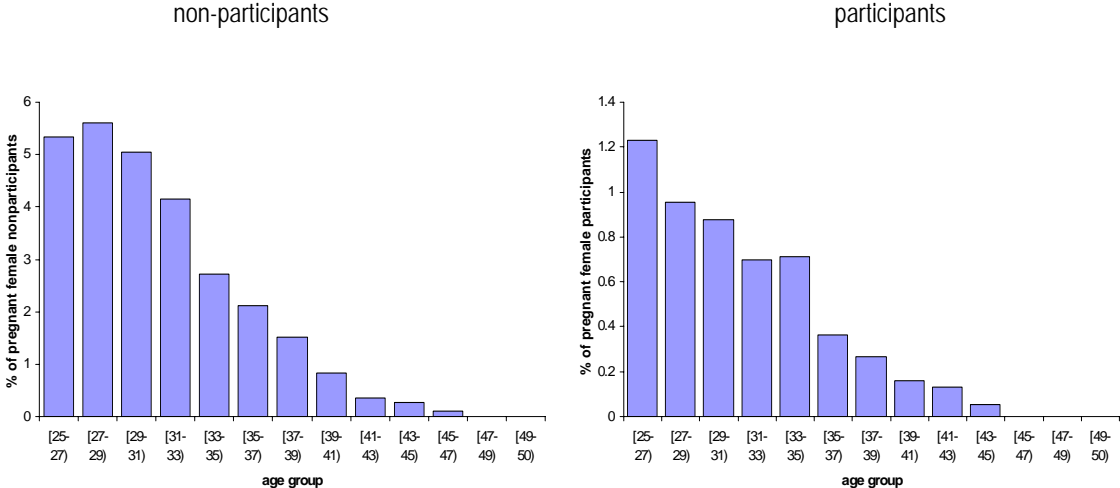
Note: Results based on matching estimation. Abscissa: Months after program entry. Ordinate: Difference of employment rates. Symbols indicate that the effect is statistically different from zero at the 95% level. SEE: socio-economic enterprise, NSP: non-profit sector project, JC: job coaching, AJS: active job search, QM: qualification measure, CS: course subsidy. Participants (male/female): SEE (343/340), NSP (300/347), JC (206/243), AJS (9641/9638), QM (6869/11330), CS (4549/5587).

The result is rather striking. Three years after program start we do not find any significant effect for any program type, neither for men nor for women. Moreover, we observe that the relative dominance of the women melted down towards zero. It appears that the only remaining difference appears for qualification measures with significant negative effects for men and insignificant effects for women. Hence, we do not find substantial effect premia for women as soon as we incorporate times of PP. The premia in Figure 2 appeared because female non-

participants take an additional outside opportunity, i.e. becoming a mother, which leads to comparably low employment rates for this pool of women. Men are much less affected by such issues and we therefore observe only the program effect, which is zero in most cases.

From a policy maker perspective, the valuation of the results is ambiguous. If additional kids are considered as desirable as employment, then the programs are ineffective. If not, then the increase in the employment effect for women at the cost of reducing or postponing fertility may be desirable and considered as a 'positive' outcome of the active labor market policies.

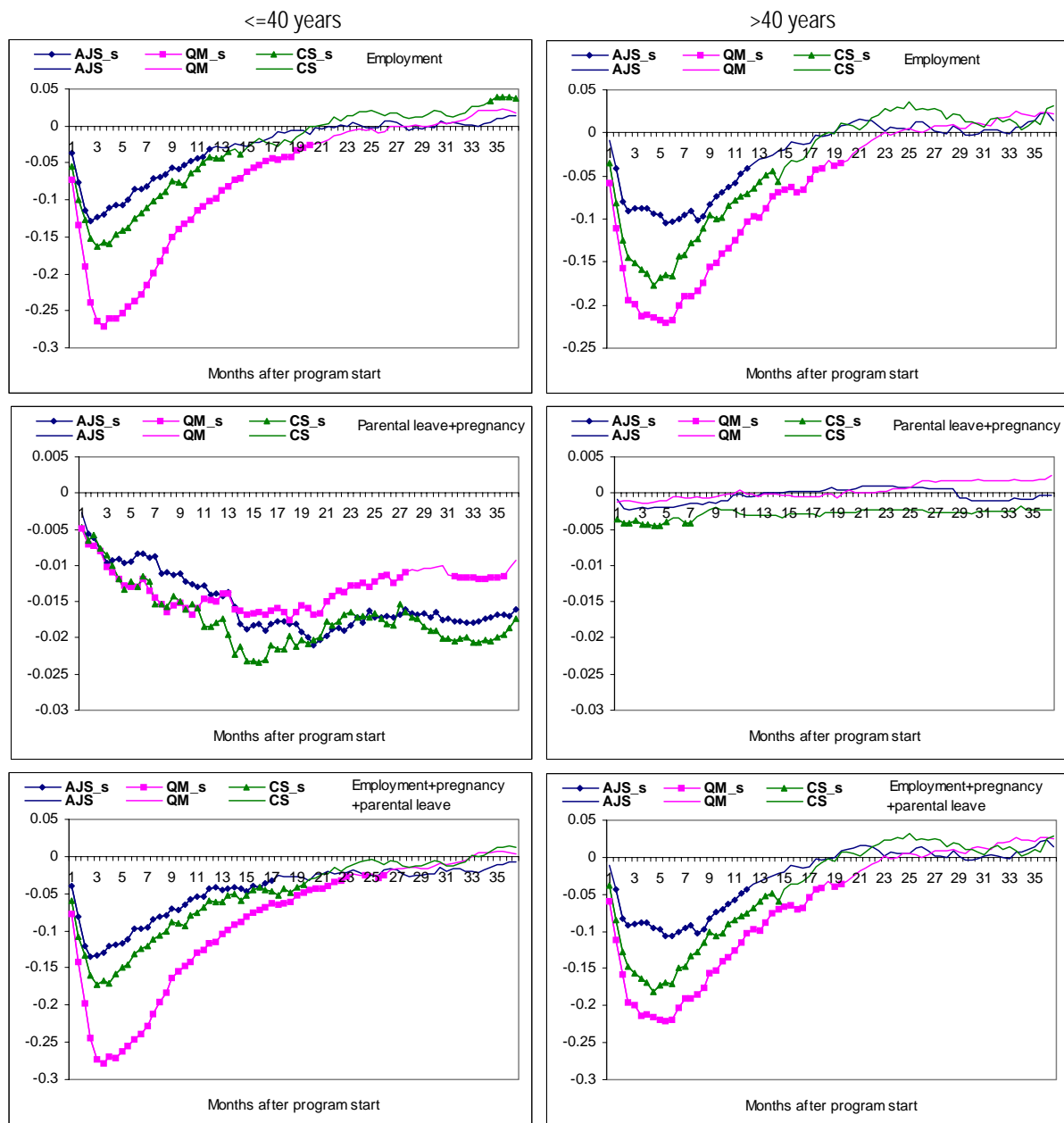
Figure 6: Percentage of pregnant women by program status and age group



Note: The pregnancy status is computed right before the (hypothetical) program start. For this illustration we pooled all program categories due to the small fraction of pregnant women per program type.

Due to the large size of the population in this study, it is possible to stratify female participants further, i.e. per age group, to get a clearer picture of the underlying heterogeneity relating to this effect. Thus, we divide all women into two age groups, below and above 40 years, to separate two groups that differ with respect to individual family plans. Doing so, 97.6 per cent of all pregnancies just before the hypothetical program start are in the lower age group. Due to population size restrictions, we consider the three larger programs only, active job search, qualification measures, and course subsidies.

Figure 7: Effects of program participation versus non-participation: Women per age group



Note: Results based on matching estimation. Abscissa: Months after program entry. Ordinate: Difference of employment rates. Symbols indicate that the effect is statistically different from zero at the 95% level. SEE: socio-economic enterprise, NSP: non-profit sector project, JC: job coaching, AJS: active job search, QM: qualification measure, CS: course subsidy. Participants (<=40/>40): AJS (6163/3493), QM (7569/3762), CS (3672/1917).

Figure 7 shows that splitting the female population according to age, we observe that the positive effect for course subsidies can be attached to women younger than 40 years. For this group we observe that all programs have a negative effect on PP. For the older segment in turn, we do not observe such effects. Overall, for both age groups we fail to detect positive effects once we take employment *plus* PP as the outcome variable. This confirms our result

that small positive effects, here for course subsidy, only appear because participation increases the attachment to the labor force. In contrast, eligible non-participants subsequently chose to put more emphasis on family planning, which leads to lower employment rates compared to those participants they have been matched to.

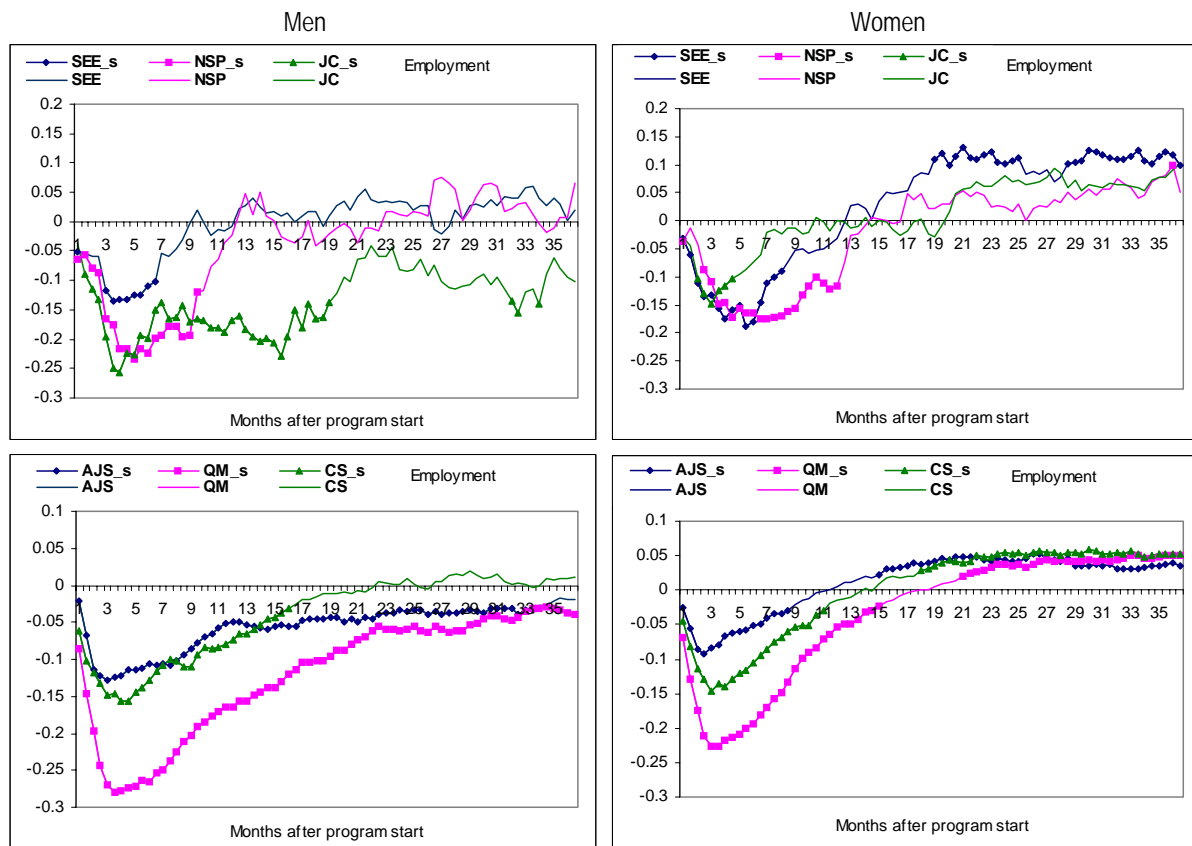
5.3 Pregnancy bias - a sensitivity check for omitted variables

As became clear in the previous section, one important feature of this study is that we use information on parental leave and pregnancies as an outcome variable as well as for correcting for potential selection bias, as pregnant women are rarely observed in labor market programs. Thus, if this variable is not controlled for, it is likely that a larger share of pregnant women appears in the group of nonparticipants which will bias the employment effects upwards.

Now, we analyze the size of this bias by comparing our results to results that would have been obtained without that information. First, we do not delete persons who are in parental leave right before the (hypothetical) program entry and, second, we leave out the month of pregnancy from the selection model. Figure 8 summarizes the results.

Obviously, the results for men are not affected by this change since parental leave is a minor issue here. For women, all effects increase by approximately 2-3 percent compared to Figure 2. For socio-economic enterprises this results in a wider range of significant positive effects, especially at the end of the follow-up period. For active job search, qualification measures, and course subsidies we now observe significant positive effects that are stable from the middle of the follow-up period onwards. According to these estimation results we would conclude that we find clear evidence of positive effects for women for four out of six labor market programs, which is highly misleading given the results in the previous sections.

Figure 8: Effects of program participation versus non-participation: Employment in %-points



Note: Results based on matching estimation. Abscissa: Months after program entry. Ordinate: Difference of employment rates. Symbols indicate that the effect is statistically different from zero at the 95% level. SEE: socio-economic enterprise, NSP: non-profit sector project, JC: job coaching, AJS: active job search, QM: qualification measure, CS: course subsidy. Participants (male/female): SEE (343/340), NSP (300/347), JC (206/243), AJS (9642/9640), QM (6869/11332), CS (4552/5594).

To wrap up, we find two important impacts of the observability of times of parental leave. First, by constructing the pregnancy status for women, it removes a remaining omitted variable bias. Second, it can be used to interpret program effects in the follow-up period.

6. Conclusion

This study provides an econometric evaluation of several important active labor market programs in Austria. Large and informative administrative data is used to control for potential selection problems. As a particular advantage of the data, we identify times of pregnancy and parental leave. For women, this information turns out to be very important for reducing selection bias as well as for understanding the effects of the programs.

For men, we find the programs to be generally ineffective in increasing unsubsidized employment. However, without controlling for pregnancy status, most programs appear to be effective in increasing employment prospects for women. Those effects become smaller once the pregnancy information is taken into account, but they are still there. A closer investigation shows that the programs increase female employment by reducing the share of women leaving the labor force. The underlying mechanism is that the programs reduce the pregnancy rate of the participants. Once that effect is subtracted from the employment effects, almost all gender differences disappear.

Our findings about the gender differences may explain results appearing in the survey by Bergemann and van den Berg (2006). They find that women's effect premia predominantly occur in countries with a low female work force participation indicating that times for childcare and labor market participation are less compatible or exclusive. We demonstrate for the case of Austria that it is important to have information about the outside opportunities of women, like times of parental leave. The puzzle of women's effect premia might be partially explained by the fact that important confounders (and outcome measures), like the ones discussed above, have not been available in other studies.

The question whether our results for women – a positive employment effect and a zero effect on the fertility *plus* employment outcome – indicate that the definition of a program success depends on the valuation of the policy makers. If additional (or earlier) kids are considered as desirable as employment, then the programs are ineffective. If employment is considered more important, then the increase in the employment effect for women at the cost of reducing or postponing fertility may be desirable and considered as a 'positive' outcome of the Austrian active labor market policies. This conclusion is most likely true not only for Austria, but for many other European countries as well.

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