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# ABSTRACT

## Labour Supply Effects of a Subsidised Old-Age Part-Time Scheme in Austria*

In this paper we evaluate the impact of the old-age part-time scheme (OAPT) on the Austrian labour market which was a policy to allow flexible retirement options for the elderly with an aim to increase labour supply. According to our matching estimates employment probability increases slightly, especially in the first two years after entrance into the programme. Furthermore, the programme seems to reduce the measured unemployment risk. However, the total number of hours worked is significantly reduced by OAPT. While the policy is meant to reduce early exit from the labour force by allowing part-time work, our analysis indicates that most workers substitute part-time work for full-time work and thus the overall effect is rather negative.

JEL Classification: C31, J14, J26

Keywords: evaluation of labour market programmes, labour supply of the elderly, nearest neighbour matching

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## 1. Introduction

Phased retirement is an often mentioned slogan in policy debates. This retirement option would allow workers to stay with their current employer, but with reduced hours and effort. From a socio-psychological point of view, phased retirement is meant to ease the often sudden change of life pace, allowing a more gradual reduction of responsibilities as well as stress; thus reducing pension shocks and allowing a more fulfilling end of a lifetime of work. On the other hand, phased retirement can help to preserve valuable firm-specific human capital in the workplace: While elderly workers might have trouble to compete with younger colleagues in terms of speed and physical fitness as well as in terms of the length of attention span or the ability to concentrate for longer periods (Skirbekk, 2004), in other tasks like verbal or organizational skills elder workers are often better. These are in particular firm-specific skills which are very valuable to the firm. Phased retirement might be a good option to preserve these skills for the firm. In spite of these alleged advantages, phased retirement is rare in most countries (Hutchens and Grace-Martin, 2006).

Austria introduced a special subsidy program for phased retirement schemes in the year 2000. While the aforementioned arguments played a role in the discussion of the law, labour market policy was important as well. Austria traditionally has had a relatively high unemployment rate of elderly workers together with generally low participation and employment rates of the concerned age group: Given that labour demand is inflexible and does not provide enough part-time jobs for elderly workers who want such phased retirement, introducing subsidies might increase labour force attachment of elderly workers. On the other hand, allowing phased retirement might reduce labour force attachment because it can lead to a form of early retirement.

In this paper we evaluate the Austrian Old-Age Part-Time Scheme (OAPT) using a matching approach looking at employment and unemployment probabilities as well as the number of hours worked. The remainder of the paper is organized as follows. Section 2 provides an overview of the OAPT scheme. Section 3 presents theoretical consideration and international evidence. Section 4 describes the evaluation methodology. Section 5 discusses the results and Section 6 concludes.

## 2. The Old-Age Part-Time Scheme in Austria

The Austrian Old-Age Part-Time Scheme[2] provides benefits paid to employers in connection with working time reductions of older employees. The scheme is based on a bilateral agreement between the employer and the employee on a working time reduction of between 40% and 60% of working hours prior to the working time reduction. Eligible workers must have had a full-time job before the subsidised scheme with working hours at least at 80% of a regular full-time employment.

[2] The Austrian old-age employment scheme "*Altersteilzeit*" underwent several changes since its introduction in January 2000. The following discussion focuses on the second 'regime', as it was in place from September 2000 to December 2003.

The entry conditions implied a compensatory wage (*Lohnausgleich*) up to a total gross salary of 75% of the compensation before the reduction of working time. Furthermore, social security contributions had to be paid at the same amount as before the working time reduction[3]. The minimum access age was set to 50 years of age for female employees and to 55 for men, respectively. Eligibility required, moreover on the part of the worker previous regular employment periods of at least 780 weeks within the last 25 years. While a first version of the scheme required on the part of the employer the hiring of an additional employee (*Ersatzarbeitskraft*), this requirement was abolished later on – in the period we are observing. The subsidy period was fixed at a *maximum* of 6 ½ years.

Moreover, the second regime of the OAPT scheme provided for a relatively flexible allocation of working time. OAPT employment could be split into a period of full-time employment followed by a non-working period at the end, as long as the agreed reduction of working hours was reached *on average* over the total period – which can be considered as a form of early retirement. The OECD in particular noted this issue: "*To a considerable extent participants in AT have allocated 'part-time work' such that they work full-time during the first years covered by the scheme and cease working during the remainder of this period*" (OECD 2005, 51).

To summarize: the advantage of OAPT for employers is that the firm can reduce the amount of working hours of elderly workers with an equivalent reduction in monthly wage costs; on the other hand, workers can adapt actual working hours closer to optimal hours while most of the reduction in working time is compensated for by the government.[4]

## *Participation structure in the Austrian scheme*

In 2006 more than 30,000 employees participated in the Austrian OAPT-scheme. The highest take-up was reached in 2004 with the number of participants reaching almost 40.000. According to the Federal Ministry for Labour and Commerce total expenditures for promoting the OAPT-scheme amounted to 455.9 million EUR in 2006. In 2004 the share of OAPT related expenditures (563.5 Mio. EUR) accounted for three quarters of total expenditure spent on active labour market policy for over 45 year old workers (see BMWA 2005). An empirical assessment of this important programme is therefore long overdue.

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[3] In Austria social security contributions are calculated as a fixed percentage from the gross salary. This gross salary serves as a calculation basis (*Beitragsgrundlage*) for contributions which are split into an employer's and a employee's part (*Dienstgeber- und Dienstnehmeranteil*). Within the old-age part-time scheme social security contributions by the employer still have to be paid in full. The employee's payments are calculated with respect to the new gross salary (including the compensatory wage). The remaining difference to the prior contribution payments has to be paid by the employer.

[4] Schnalzenberger and Winter-Ebmer (2008) study another feature of Austrian legislation which was meant to protect employment of elderly workers: a layoff tax of elderly workers.

Table 1 illustrates the structure of OAPT participants relative to a reference population of employees 50 years and older. The description accounts for gender, Federal province, industry, firm size, firm employment dynamics and real income. Regarding gender, men form the larger part of participants (53.4%). Relative to the reference population of employees aged 50 years and over, however, female participants are marginally over represented among OAPT participants. With regard to regional structure the population size is more or less reflected within the participation structure. With a cumulative share of almost 70% Vienna, Lower Austria and Upper Austria together contain a majority of participants. Compared to the reference population, the latter two regions show a marginal over-representation of OAPT participants. The industry structure indicates that OAPT is most commonly used in the manufacturing sector, trade, and public administration including the health sector and education. Compared to the industry structure of the entire population of older workers manufacturing and financial intermediation are over-represented. In contrast, the share of older workers employed in the public administration is higher than among OAPT participants. A majority of OAPT participants are employed in larger firms with more the 250 employees. Larger firms' share of participants is considerably higher than the share of older workers in larger firms generally, indicating that OAPT is more commonly used in larger enterprises. Regarding the dispersion of participants by real income our results indicate that OAPT is more commonly used by workers with higher earnings. About one quarter of OAPT participants earns more than 3,500 EUR[5] and only 16% less than 1,800 EUR. In 2006 the median income of 50 to 54 years old workers was 1,970 EUR and 2,090 EUR for 55 to 60 years old workers. The median income of OAPT participants was 2,680 EUR. In order to examine the employment dynamics at the firm level we compare firm sizes at the beginning and at the end of the observation period. Therefore we differentiate between firms with a decreasing, stagnating or increasing number of employees over time[6]. The largest part of OAPT participation is from firms with declining employment (42 %). Only every fourth OAPT participant works in a growing firm.

## *3. Theoretical approach and international evidence*

The original policy argumentation behind the OAPT scheme was to raise employment incentives for older workers and to defer retirement decisions. The research question underlying the following discussion is, whether and to what extent the Austrian OAPT scheme has a positive or negative effect on older workers' labour supply. In other words, in which way does the part-time scheme determine retirement decisions and the remaining number of hours worked.

In a simple labour supply model decisions are determined by workers' preferences. Under the assumption that employers are indifferent about the number of hours worked by an individual worker, workers are free to choose the number of working hours at a given wage according to their

[5] All earnings had been deflated to a year 2000 basis.

[6] Based on the average number of employees in the first half of the observation period (2000-2003) compared to the second half (2004-2007). By definition 'stagnating firms' show an employment variation between +/-10%. 'Increasing/decreasing firms' grew/declined at a higher rate.

preferences between consumption and leisure. In practice employers might have preferences regarding the number of hours worked by each employee. Due to fixed employment costs or coordination costs employers might limit their labour demand to a specific minimum number of working hours (see Gielen 2007, Charles and DeCicca 2006). Such minimum hours constraints might be due to some sort of team work in the firm: efficiency will require that all team members are present most of the time; reduced hours of one worker will have negative consequences for the productivity of the others. Supervisory costs could be another reason why reduced hours of some workers are costly to the firm. Finally, issues of work organization, assembly lines or workplace equipment might make it costly to allow part-time work.

Figure 1 describes the decision process of a worker underlying such constraints on weekly working time. As the worker values hours of leisure and consumption positively she faces a trade off between more leisure or more consumption. If she could choose freely the number of hours of work per week, she would choose 20 hours (A), but if the firm has fixed employment costs, only 0 (B) or 40 hours (C) are possible: depending on the preferences for leisure, which might be relatively high for workers above age 50, some workers might choose 0 hours and opt for some form of “early retirement” which might be either unemployment or other forms of inactivity, including retirement due to health reasons, etc.

Survey results indicate that especially older workers would prefer to reduce working time (Prager and Schleiter 2006, EEIG 2004). Charles and De Cicca (2006, 252) argue that in the absence of possibilities to reduce working time workers might leave the labour market completely and opt for early retirement. Based on survey data they show that workers, who faced stricter hours constraints at an earlier point of time, were much more likely to be retired at a later point than their unconstrained peers. Thus hours constraints can increase older workers’ incentives for early retirement and thus have a negative effect on older workers’ labour supply. If this is the case an OAPT scheme can be used as an instrument to reduce hours constraints and, in turn, to boost older workers’ labour supply. The OAPT scheme can have a positive effect on older workers’ labour supply if they are able to bargain a working time reduction according to their preferences instead of having to leave the labour market completely due to the absence of such a possibility.

The approach presented above requires an existing alternative option for early retirement. If this is not available, i.e. leaving the labour market into early retirement is not possible, it is not clear how an introduction of an OAPT scheme could increase labour supply of older workers. The availability of early retirement options, alongside other dimensions such as health status, depends on the age of the workers. One has to keep in mind that the eligibility age to the OAPT scheme in Austria was age 50 for women and age 55 for men. According to EUROSTAT data the average exit age from the Austrian labour force in 2002 was 59.2 years for women and 59.4 years for men. Within the scope of the 2000 pension reform the access age for early retirement was raised to 56 ½ years for women and 61 ½ years for men. Against the background of relatively low eligibility ages for OAPT on the one hand, and stricter age eligibility for early retirement on the other hand, the OAPT scheme can be considered

more as a bridge into (early) retirement. It has to be seen how an increase in hours-flexibility can mitigate this strong incentive for a reduced labour supply.

There is not much research on labour supply effects of age-specific subsidies. Gielen (2007) analyses the labour market transitions of hours-constrained workers in the UK labour market, i.e. for workers who would prefer to work fewer hours. Based on a competing risk approach she models employment durations of workers over 50 years old. Under the assumption that leaving the labour market is only one possible alternative for hours-constrained workers she differentiates between five destination states: retirement, inactivity (for example unemployment), hours reduction with the current employer and changing employers with or without reducing working hours. Gielen (2007) applies data from the British Household Panel Survey over the period 1991-2004. The dataset comprises information on workers' preferences on working hours assuming the same amount of compensation per hour and on whether workers would prefer to work fewer hours, more hours or continue with the same number of working hours. Additionally, the data contain information on the workers' satisfaction with the number of working hours. Gielen's results indicate that a reduction of hours constraints could prolong the working lives of older women. Hours-constrained older women having to work too many hours leave the labour market earlier. On the other hand, men working more than the preferred hours tend to be able to adjust working hours with their current employer. In contrast to women over-employment has no effect on male retirement behaviour. It seems that men either have a larger bargaining power against their employers or their imbalance in terms of working hours is not so big.

Regarding the 'activation' effect of hours-flexibility, Gielen (2007) differentiates between active working years and total labour supply in hours. As mentioned above, increasing hours-flexibility can prolong labour force participation of over-employed female workers. On the other hand, total labour supply in terms of hours may decrease if there is an opportunity to reduce working hours. Assuming that hours constraints induce older workers to opt for working full-time or not at all, an over-employed worker might leave the labour market completely *or* stay (over-) employed with the same number of working hours. Introducing hours-flexibility might raise the labour supply in comparison to a state where a worker would have left the labour market completely. Conversely, hours-flexibility might have a lowering effect on total labour supply if the person had stayed employed with the same number of working hours instead of decreasing the number of hours worked. The net employment effect depends on the relative size of these effects.

The old-age part time scheme can thus be seen as an instrument to increase the hours-flexibility of older workers. Lowering hours constraints might have a positive supply effect in terms of prolonging labour force participation. The net supply effect however depends on alternative labour market behaviours (counterfactually) and therefore is an empirical question. Some European countries introduced a similar form of subsidized part-time scheme for older workers, but the evaluation literature is not very comprehensive. Wadensjö (2006) estimated the effect of the Swedish partial-pension scheme on the total number of hours worked. His results indicate that the positive supply effect – whereby participants work part-time instead of opting for an early retirement route – outweighs the negative effect of workers reducing working time instead of continuing in full-time employment.

Ilmakunnas and Ilmakunnas (2006) analysed the Finish partial pension scheme and found no effects on the timing of retirement.

With regard to the labour market effects of the *German* Old-Age Part-Time Scheme Eichhorst (2006) comes to a rather critical assessment. Similar to the Austrian scheme the German OAPT offers the possibility to allocate 'part-time' work into a full-time period in the first half of OAPT and a leisure period in the second half. According to Eichhorst (2006, p. 11) this 'blocking-modell' provides an incentive against a more gradual transition from employment into retirement. In practice the blocking-option encourages older workers to leave the labour market earlier at the beginning of the 'leisure-period'. As in Austria, the German OAPT-scheme requires the hiring of an additional employee. Regarding the intended positive labour demand effect of this requirement, Wagner (2009) points to the risk of dead-weight effects, when extra recruitment would have occurred even without participation in the OAPT Scheme. In 2002 a Part-Time-Scheme for older workers was introduced in *Belgium* (see Devisscher and Sanders 2007, Devisscher, 2004). The so-called career-break allowed employees to reduce the number of working hours for a maximum of five years without losing their social security rights e.g. pension benefits of a fulltime work regime. Devisscher and Sanders (2007, 8-9) state "its use has until quite recently been limited to a rather privileged group of persons", referring to the specific participation structure in the career-break scheme – a large share of participants belonging to two-earner households, the scheme being used relatively more in the services sector than in industries and employees of larger companies making more use of career breaks than employees in smaller enterprises. These authors refer to an evaluation of the career break scheme carried out by OSA/Steunpunt WAV in 2006. The results are based on the survey analysis of career paths of career breakers before, during and after their career break. The career paths of career breakers were compared with those of a control group of employees without a career break. The results provide "*no evidence that the activity rate of over 50* [year old] *persons with a career break is higher (one to three years after the career break) than that of a control group of 50-plus employees, rather on the contrary.*"

## *4. Evaluation approach*

We base our analysis on the prototypical treatment model of the microeconometric evaluation literature, the binary potential outcome model (Rubin causal model). For individual $i, i = 1...N,$ let $Y_i(1)$ denote the potential response of individual $i$ being exposed to the treatment and $Y_i(0)$ the potential response if $i$ receives no treatment, where $D_i = \{0,1\}$ is the indicator of exposure to treatment.

We investigate the average treatment effect on the treated (ATT), which focuses explicitly on the effects for those the treatment is intended. It is given by $\Delta_{ATT} = E(Y(1) \mid D(1)) - E(Y(0) \mid D(1))$. The first part of the expression can be identified for the treatment group subsample; the second part is counterfactual and not identifiable without invoking further assumptions. The unconfoundedness assumption (i) and the overlap assumption (ii) ensure that the matching estimator identifies and

consistently estimates the ATT:[7] For all $x$ in the support of $X$, (i) $D$ is independent of $(Y(0), Y(1))$ conditional on $X = x$; and (ii) $c < P(D = 1 \mid X = x) < 1 - c$, for some $c > 0$. The unconfoundedness assumption is often controversial, as it assumes that there are no (unobserved) characteristics of the individuals associated both with the potential outcomes and the treatments, besides the observed covariates $X$.

In this paper we apply the Abadie-Imbens (nearest neighbour) matching estimator with bias-correction (Abadie and Imbens 2002, 2007). The simple matching estimator for the ATT estimates the unobserved outcome by averaging the observed outcomes for the observations $l$ of the opposite treatment group that are chosen as matches for $i$[8]. In contrast to propensity score matching, the matching is performed on the covariates $X$[9].

$$\hat{\Delta}_{ATT} = \frac{1}{N_1} \sum_{i:D_i=1} \left\{ Y_i - \hat{Y}_i(0) \right\}, \text{ where } \hat{Y}_i(0) = \frac{1}{\# J_M(i)} \sum_{l \in J_M(i)} Y_l .$$

This simple matching estimator will be biased in finite samples due to the differences between the covariates of the matched observations and their matches. Abadie and Imbens (2002, 2007) suggest regression methods to reduce the bias. The bias-corrected matching estimator uses an adjustment, which is based on the estimate of the regression function $\mu_d(x) = \mathrm{E}\{Y(d) \mid X = x\}$ for $d = 0$. The regression function is approximated by a linear function and estimated by using least squares on the matched observations. Given the estimated regression functions, the missing potential outcome is now predicted as

$$\hat{Y}_i(0) = \frac{1}{\# J_M(i)} \sum_{l \in J_M(i)} Y_l + \hat{\mu}_0(X_i) - \hat{\mu}_0(X_l).$$

We use the following formula for estimating the variance of the ATT:

$$\hat{V} = \frac{1}{N_1^2} \sum_{i=1}^{N} \{D_i - (1 - D_i) K_M(i)\}^2 \frac{1}{2N_1} \sum_{i:D_i=1} \left\{ \frac{1}{J_M(i)} \sum_{l \in J_M(i)} \left( Y_l - Y_i - \hat{\Delta}_{ATT} \right)^2 \right\}$$[10].

## *5. Empirical results*

We estimate the effect of OAPT on employment, full-time equivalent employment, and unemployment for a four year evaluation period starting with the entrance in OAPT. The results for three and five year

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[7] See Abadie und Imbens (2002, 2007) for further technical assumptions.

[8] $N_1$ is the number of treated individuals. Let $J_m(i)$ denote the set of indices for the matches of unit $i$ that are at least as close as the m-th match. The number of elements of $J_m(i)$ is denoted by $\# J_M(i)$. Let $K_M(i)$ denote the number of times $i$ is used as a match for all observation $l$ of the opposite treatment group, each time weighted by the total number of matches for observation $l$ (see Abadie et al. 2004).

[9] We use the Stata procedure nnmatch (Abadie et al. 2004) in our estimation. The diagonal matrix constructed of the inverses of the variances of each element of $X_i$ is used for the metric for measuring the distance between two vectors of covariates. We set the number of matches m=4.

[10] This assumes that the treatment effect, $Y_i(1) - Y_i(0)$, is constant and that the conditional outcome variance does not vary with either the covariates or the treatment (see Abadie und Imbens 2006 for theoretical justifications for various variance estimators).

periods are presented as robustness checks. We take the data from AMDB (Arbeitsmarktdatenbank), a very informative individual administrative database for all gainful employed Austrian workers. AMDB combines information from the social security records and from registers of the Austrian public employment office (AMS). This data set is matched with administrative information for the participants of OAPT.

We select the birth cohorts 1943/44 (males), and 1946/47 (females), respectively. Only for these cohorts the observation period is long enough. The treatment group includes all participants entering the OAPT scheme between 2000 and 2003. For the construction of the control group we select all workers, who were employed at least one day in the period 2000/2001 in the private sector of the Austrian economy. For the control group we simulate a hypothetical start date for enrolment in the OAPT scheme and drop all workers not employed at this date. This procedure leads to a sample of 3,210 participants and 28,651 non-participants (females), and 6,142 and 23,810 (males), respectively. As expected we find considerable differences in the characteristics between participants and non-participants, therefore we apply the matching procedure suggested by Abadie and Imbens (2002, 2007).

Matching is valid only if the assumption of conditional unconfoundedness is fulfilled, which means that the selection bias is only due to observed variables. This assumption is also known as selection on observables or conditional independence. We need to condition on all variables jointly influencing the participation decision and the outcome variables for fulfilling the assumption. Our data set contains a rich set of variables. We have information on socio-demographic variables (gender, sickness days, etc.), labour market history, and firm specific data (industry, employment dynamics, etc.). We use the following matching variables: employment days per year (1 to 3 years before entrance in the OAPT), unemployment, sickness absence (3 years before entrance), tenure, white-collar or blue-collar worker status, income, region, employment dynamics of the firm, industry, and firm size. For age cohorts we used an exact matching. Additionally, the information for the comparison as well as the treatment group is from the same data set and is measured at the same point of time. Given this rich dataset, we can argue that the assumption of unconfoundedness is justified in our case.

In Tables 2 and 3 we show evidence on the balancing properties of our matching estimator. Whereas in Table 2 absolute means and standard deviations of our control variables are shown, Table 3 presents normalized differences between treated and controls, on the one hand, and between treated and matched controls, on the other hand. The quality of the matches appears very high as the average difference within the matched pairs is very small compared to the average difference between treated and control group before matching.[11]

[11] The normalised difference exceeds 0.05 only for the female variables income (0.148) and sickness leave (0.056). Imbens and Wooldridge (2009) cite that linear regression methods tend to be sensitive to the specification if the normalized difference exceeds one quarter. Note that we use a bias-corrected matching estimator.

Table 4 shows the estimated labour market impact of OAPT. Two output measures for the employment effect are used. First, we consider the impact on days in employment; then the impact on total hours worked is analysed. We assume that all workers profiting from the OAPT scheme have reduced their working time by 50 percent. Finally we look at the impact on unemployment. Note that workers on a part-time scheme are counted as employed in national statistics during the full time of their contract – regardless of any timing or blocking of the work load. Our estimates suggest that employment is slightly increased by the OAPT. Over a four year period participants work longer (15 days for males, and 23 days for females). This corresponds to an increase of the employment probability of 1 and 1.6 percentage points, respectively. However, the treatment effect is significantly positive only in the first two years after entrance in OAPT (see Figure 2). For the fourth and fifth year we find even negative effects which results in a cumulative negative effect of OAPT on official employment figures once the full five year period is taken into account. Note that this employment measure does not take into account that OAPT participants work only part-time. Our second employment measure indicates that OAPT significantly reduces total hours worked. Over a four year period employment in full-time equivalents is reduced by 29 percentage points (males), and 25 percentage points (females), respectively.

Finally, for unemployment our matching results indicate that unemployment is reduced by the OAPT scheme: Measured unemployment is reduced over a three-to-five year period by one to one and a half month.

We can use our matching results to make a back-of-the-envelope calculation to estimate the aggregate effects of OAPT for the age group 50-65 years. We can make us of the share of workers in this age category participating in the OAPT to calculate aggregate employment effects. As the OAPT is primarily reducing working time of the participating individuals, abolishing the scheme would imply that employment in full-time equivalents increases by 1.5 percentage points. On the other hand, the measured unemployment rate would increase by 0.2 percentage points. Given the relatively high public expenditures, OAPT is certainly an inefficient measure to support employment of the elderly.

## 6. Conclusions

Austria introduced a heavily subsidized old-age part-time scheme in 2000 which became very popular soon. In 2004 almost 40.000 workers participated and expenditures for the scheme amounted to 0.25 % of GDP. One aim of the scheme was to increase attachment of older workers to the labour market by providing a more worker-friendly phasing- out of working life. However, our results indicate that most workers substituted part-time work for full-time work. The labour supply of older workers, measured by the total numbers of hours worked, decreased significantly.

Our findings are in line with the experiences of other countries concerning part-time and partial pension schemes. These schemes don’t seem to be successful in prolonging working life but rather to act as alternative pathways in early retirement. Given the enormous costs, further reforms in the design of the scheme are necessary. First of all, the entrance age into the scheme should be oriented

towards statutory retirement age in order to arrange phasing out of working life around (!) usual retirement age and, thus, actually increasing final retirement age. Second the blocking option should be banned. This would reduce the attractiveness of the scheme but also the deadweight loss.

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**Table 1: Structure of OAPT participants**

| | OAPT-Participants | | Employees 50+[1] | |
|---|---|---|---|---|
| | *abs.* | *rel.* | *abs.* | *rel.* |
| Sex | | | | |
| Males | 30,721 | 53.4 | 285,930 | 57.5 |
| Females | 26,795 | 46.6 | 211,766 | 42.5 |
| Federal state | | | | |
| Burgenland | 1,435 | 2.5 | 12,544 | 2.5 |
| Carinthia | 2,472 | 4.3 | 27,279 | 5.5 |
| Lower Austria | 11,797 | 20.5 | 78,015 | 15.7 |
| Upper Austria | 13,048 | 22.7 | 83,487 | 16.8 |
| Salzburg | 3,404 | 5.9 | 35,390 | 7.1 |
| Styria | 5,890 | 10.2 | 56,424 | 11.3 |
| Tyrol | 2,578 | 4.5 | 34,198 | 6.9 |
| Vorarlberg | 1,934 | 3.4 | 20,517 | 4.1 |
| Vienna | 14,958 | 26.0 | 134,325 | 27.0 |
| Industry | | | | |
| Agriculture and Forestry | 478 | 0.8 | 5,891 | 1.2 |
| Energy/Mining | 1,979 | 3.4 | 9,759 | 2.0 |
| Manufacturing | 18,561 | 32.3 | 104,630 | 21.0 |
| Construction | 3,463 | 6.0 | 43,999 | 8.8 |
| Trade | 9,646 | 16.8 | 79,909 | 16.1 |
| Hotels and Restaurants | 1,109 | 1.9 | 21,178 | 4.3 |
| Transport | 1,940 | 3.4 | 27,847 | 5.6 |
| Financial Intermediation | 4,513 | 7.8 | 22,832 | 4.6 |
| Business Activities | 4,091 | 7.1 | 52,248 | 10.5 |
| Public Administration [3] | 9,151 | 15.9 | 102,497 | 20.6 |
| Other Services | 2,438 | 4.2 | 26,418 | 5.3 |
| Unknown | 147 | 0.3 | 488 | 0.1 |
| Firm Size | | | | |
| 0 - 10 Employees | 10,159 | 17.7 | 98,452 | 19.8 |
| 11 - 50 Employees | 9,207 | 16.0 | 102,904 | 20.7 |
| 51 - 250 Employees | 14,212 | 24.7 | 118,212 | 23.8 |
| 250+ Employees | 23,925 | 41.6 | 178,128 | 35.8 |
| Real Income | | | | |
| Median in EUR | 2,677 | | 2,033[6] | |
| N | 57,516 | | 497,696 | |

[1] Reference population formed by over-50 year-old employees (Day of record: 31th of May 2006).

[3] including Education and Health.

[4] expressed in prices of year 2000 earnings.

[6] Mean of 50 to 54 years old workers and 55 to 59 years old workers. (Source: Hauptverband der Sozialversicherungsträger)

Source: AMDB, IHS.

**Table 2: Matching Variables: Covariates of Treatment and Matched Controls**

| | Females | | | | Males | | | |
|---|---|---|---|---|---|---|---|---|
| | *Treatment* | | *Matched controls* | | *Treatment* | | *Matched controls* | |
| | *Mean* | *SD* | *Mean* | *SD* | *Mean* | *SD* | *Mean* | *SD* |
| Employment Year 1 | 361.2 | 28.21 | 362.2 | 23.71 | 361.6 | 25.67 | 362.4 | 22.26 |
| Employment Year 2 | 359.9 | 34.70 | 361.2 | 30.29 | 360.6 | 32.66 | 361.5 | 29.58 |
| Employment Year 3 | 359.1 | 38.40 | 360.0 | 35.87 | 359.2 | 38.55 | 360.0 | 35.87 |
| Tenure | 4527.4 | 3192.22 | 4365.2 | 3032.82 | 4869.1 | 3734.49 | 4832.7 | 3558.14 |
| Birth year 1947 or 1944 | 0.725 | 0.45 | 0.725 | 0.45 | 0.587 | 0.49 | 0.587 | 0.49 |
| Unemployment (1-3 years) | 0.011 | 0.06 | 0.009 | 0.05 | 0.009 | 0.06 | 0.008 | 0.05 |
| Sickness leave (1-3 years) | 7.232 | 32.68 | 4.828 | 27.60 | 4.593 | 25.52 | 3.071 | 21.04 |
| Accident benefit | 0.008 | 0.09 | 0.007 | 0.08 | 0.019 | 0.14 | 0.019 | 0.14 |
| Firm Employment Dynamics | 2.037 | 0.68 | 2.042 | 0.63 | 2.024 | 0.69 | 2.025 | 0.66 |
| White-Collar-Worker | 0.768 | 0.42 | 0.758 | 0.43 | 0.697 | 0.46 | 0.688 | 0.46 |
| Federal States (Vienna) | | | | | | | | |
| Unknown | 0.008 | 0.09 | 0.008 | 0.09 | 0.006 | 0.08 | 0.006 | 0.08 |
| Burgenland | 0.028 | 0.17 | 0.028 | 0.16 | 0.019 | 0.14 | 0.019 | 0.14 |
| Carinthia | 0.039 | 0.19 | 0.039 | 0.19 | 0.031 | 0.17 | 0.030 | 0.17 |
| Lower Austria | 0.201 | 0.40 | 0.198 | 0.40 | 0.204 | 0.40 | 0.200 | 0.40 |
| Upper Austria | 0.200 | 0.40 | 0.196 | 0.40 | 0.198 | 0.40 | 0.197 | 0.40 |
| Salzburg | 0.064 | 0.25 | 0.064 | 0.24 | 0.054 | 0.23 | 0.054 | 0.23 |
| Styria | 0.099 | 0.30 | 0.098 | 0.30 | 0.090 | 0.29 | 0.089 | 0.28 |
| Tyrol | 0.044 | 0.20 | 0.043 | 0.20 | 0.040 | 0.20 | 0.040 | 0.20 |
| Vorarlberg | 0.024 | 0.15 | 0.024 | 0.15 | 0.038 | 0.19 | 0.037 | 0.19 |
| Industry (Other Services) | | | | | | | | |
| Unknown | 0.003 | 0.05 | 0.003 | 0.05 | 0.003 | 0.05 | 0.003 | 0.05 |
| Agriculture | 0.005 | 0.07 | 0.005 | 0.07 | 0.013 | 0.11 | 0.013 | 0.11 |
| Energy/Mining | 0.009 | 0.10 | 0.009 | 0.10 | 0.036 | 0.19 | 0.036 | 0.19 |
| Manufacturing | 0.236 | 0.42 | 0.234 | 0.42 | 0.388 | 0.49 | 0.394 | 0.49 |
| Construction | 0.051 | 0.22 | 0.050 | 0.22 | 0.069 | 0.25 | 0.070 | 0.25 |
| Trade | 0.189 | 0.39 | 0.189 | 0.39 | 0.187 | 0.39 | 0.184 | 0.39 |
| Hotels and Restaurants | 0.033 | 0.18 | 0.032 | 0.18 | 0.011 | 0.10 | 0.011 | 0.10 |
| Transport | 0.035 | 0.18 | 0.034 | 0.18 | 0.030 | 0.17 | 0.030 | 0.17 |
| Financial Intermediation | 0.073 | 0.26 | 0.073 | 0.26 | 0.076 | 0.26 | 0.076 | 0.27 |
| Business Activities | 0.089 | 0.29 | 0.088 | 0.28 | 0.070 | 0.25 | 0.069 | 0.25 |
| Public Administration | 0.220 | 0.41 | 0.225 | 0.42 | 0.083 | 0.28 | 0.084 | 0.28 |
| Firm Size (250+) | | | | | | | | |
| 0-10 | 0.276 | 0.45 | 0.276 | 0.45 | 0.134 | 0.34 | 0.129 | 0.33 |
| 11-50 | 0.158 | 0.36 | 0.155 | 0.36 | 0.167 | 0.37 | 0.165 | 0.37 |
| 51-250 | 0.188 | 0.39 | 0.185 | 0.39 | 0.283 | 0.45 | 0.279 | 0.45 |
| Real Income | 2363.131 | 761.23 | 2195.5 | 833.37 | 2964.7 | 676.30 | 2967.5 | 714.35 |
| | | | | | | | | |
| N | 3066 | | 12264 | | 5893 | | 23647 | |

**Table 3: Normalized Differences in Covariates: Treated versus Control and Matched Controls**

| | **Females** | | **Males** | |
|---|---|---|---|---|
| | *Controls* | *Matched Controls* | *Controls* | *Matched Controls* |
| Employment Year 1 | 0.131 | -0.028 | 0.146 | -0.024 |
| Employment Year 2 | 0.182 | -0.027 | 0.177 | -0.020 |
| Employment Year 3 | 0.214 | -0.018 | 0.183 | -0.015 |
| Tenure | 0.219 | 0.037 | 0.129 | 0.007 |
| Birth year 1947 or 1944 | 0.209 | 0.000 | 0.085 | 0.001 |
| Unemployment (1-3 years) | -0.136 | 0.029 | -0.146 | 0.023 |
| Sickness leave (1-3 years) | -0.041 | 0.056 | -0.088 | 0.046 |
| Accident benefit | -0.020 | 0.002 | -0.047 | 0.001 |
| Firm Employment Dynamics | -0.038 | -0.005 | -0.029 | -0.001 |
| White-Collar-Worker | 0.261 | 0.016 | 0.178 | 0.014 |
| *Federal States (Vienna)* | | | | |
| Burgenland | -0.010 | 0.000 | -0.072 | 0.000 |
| Carinthia | 0.046 | 0.002 | -0.002 | 0.000 |
| Lower Austria | -0.030 | 0.000 | -0.061 | 0.001 |
| Upper Austria | 0.107 | 0.006 | 0.083 | 0.007 |
| Salzburg | 0.118 | 0.006 | 0.131 | 0.003 |
| Styria | -0.032 | 0.002 | -0.038 | 0.002 |
| Tyrol | -0.012 | 0.003 | -0.003 | 0.003 |
| Vorarlberg | -0.113 | 0.001 | -0.103 | 0.001 |
| Unknown | -0.076 | 0.001 | -0.034 | 0.003 |
| *Industry (Other Services)* | | | | |
| Unkown | 0.044 | 0.003 | 0.009 | 0.000 |
| Agriculture | -0.028 | 0.000 | 0.005 | 0.000 |
| Energy/Mining | 0.026 | 0.000 | 0.030 | 0.000 |
| Manufactoring | 0.169 | 0.003 | 0.205 | -0.008 |
| Construction | 0.084 | 0.002 | -0.127 | -0.001 |
| Trade | -0.002 | 0.001 | 0.045 | 0.005 |
| Hotels and Restaurants | -0.089 | 0.002 | -0.072 | 0.000 |
| Transport | 0.003 | 0.003 | -0.145 | 0.001 |
| Financial Intermediation | 0.096 | 0.000 | 0.057 | -0.001 |
| Business Activities | -0.057 | 0.003 | -0.010 | 0.001 |
| Public Administration | -0.126 | -0.007 | -0.133 | -0.002 |
| Firm Size (250+) | | | | |
| 0-10 | -0.007 | 0.001 | -0.111 | 0.010 |
| 11-50 | -0.051 | 0.006 | -0.084 | 0.004 |
| 51-250 | -0.017 | 0.004 | 0.038 | 0.006 |
| Real Income | 0.571 | 0.148 | 0.309 | -0.003 |

Note: The normalised difference is calculated as $\frac{\bar{X}_1 - \bar{X}_0}{\sqrt{S_0^2 + S_1^2}}$, where $S^2$ is the sample variance of $X_i$ in the relevant subsample. The first column shows the difference between treated and control groups, the second column the difference between treated and matched control group.

**Table 4: Causal labour market effects of OAPT-scheme: cumulative effects three to five years after programme entrance (SE in parenthesis)**

| Cumulated effects over ... years | Male | Female |
|---|---|---|
| *Employment* | | |
| 3 years (in days) | 61.1 (5.2) | 51.3 (7.3) |
| 4 years (in days) | 15.1 (7.0) | 23.3 (9.9) |
| 5 years (in days) | -35.8 (8.1) | -17.3 (11.7) |
| *Full-time employment*(1) | | |
| 3 years (in percentage points) | -31.5% (0.42%) | -27.4% (0.58%) |
| 4 years (in percentage points) | -28.9% (0.42%). | -24.7% (0.59%) |
| 5 years (in percentage points) | -26.2% (0.40%) | -22.6% (0.56%) |
| *Unemployment* | | |
| 3 years (in days) | -26.4 (2.1) | -32.8 (2.9) |
| 4 years (in days) | -32.5 (2.8) | -38.4 (3.7) |
| 5 years (in days) | -37.5 (3.1) | -43.2 (4.5) |

(1) calculated as (difference in days in full-time equivalents) over days in the sample period; we assume that OAPT participants reduce working time by 50 percent.

**Figure 1: Deciding about hours of work in a constrained situation**

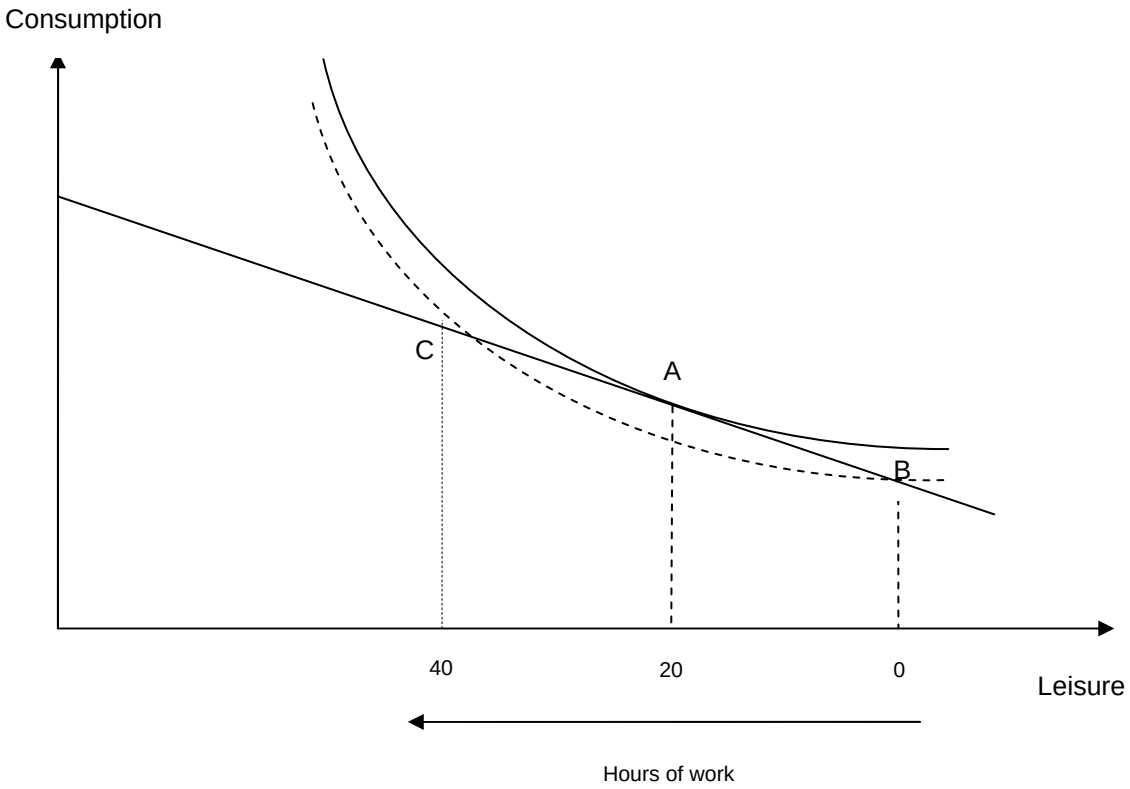

**Figure 2: Employment effect over time by gender (in days per year)**