



Layoff tax and employment of the elderly

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ABSTRACT

In 1996 Austria introduced a tax for the layoff of older workers, which was tightened in 2000. The regulation requires employers to pay a tax of up to 170% of the gross monthly income when they give notice to employees aged 50 or more. We use data from Austrian social security records to investigate if such layoff taxes lead to less firing of older workers. We compare a control group of workers aged nearly 50 with the treatment group above 50. We apply a difference-in-difference approach to analyze the difference in the displacement probability of all prime aged workers. Results show substantial reductions in layoff behavior for workers aged 50 and above after the tightening of the tax.

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1. Introduction

Population forecasts predict that in many Western European countries the young population will shrink relatively to the population above the age of 50. This may pose serious problems to the current social security system in the next decades. “If there is no change in work and retirement patterns, the ratio of older inactive persons per worker will almost double from around 38% in the OECD area in 2000 to just over 70% in 2050. In Europe, this ratio could rise to almost one older inactive person for every worker over the same period” (Organisation for Economic Co-operation and Development, 2006 p. 9).

An aging workforce in general combines in Austria with very low labor force participation rates of workers above 50. Moreover, also unemployment rates for this age group increased significantly in the early 1990s: the unemployment rate for persons above age 50 was some 40% higher as compared to prime-age workers. It seems that employers often used the unemployment insurance system as an easy way of getting rid of aging workers with higher wage demands.¹ In many cases prolonged unemployment led to early retirement in one form or the other. In order to force the firms to internalize these

neglected costs to the social insurance administration, Austria reacted with a reform in employment protection for the elderly: starting in 1996, a layoff tax was introduced to encourage the ongoing employment of people aged 50 and above.²

We will study the immediate impact of this layoff tax on the termination of employment contracts for elderly workers. Economic theory would suggest important ramifications of this law: due to increased job protection, hiring behavior of firms with respect to highly-protected elderly workers might be affected as well. In addition, due to the partial character of the employment protection, substitution processes might occur: If firing of elderly workers gets punished by a layoff tax, why not lay off somebody else? Due to the construction of the Austrian law – workers subject to the layoff tax have to be employed in the firm for at least ten years – detrimental impacts on hiring behavior are highly unlikely. As the typical retirement age of Austrian workers is well below age 60, this tenure condition will not bite for hires above age 50.

Several authors have looked at the impact of partial employment protection on changes in the employment structure (Acemoglu and Angrist, 2001, Kugler and Pica, 2005, Hernanz et al., 2002). Behaghel et al. (2008) analyzes a similar regulation for France: the “Delalande tax”. As the French law has not very strict tenure restrictions on the applicability of the layoff tax, Behaghel et al. (2008) are principally interested in detrimental side effects of this malus legislation: the reduced hiring of elderly workers. Boockmann et al. (2007) look at a

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¹ Ichino et al. (2006) extensively study re-employment problems of elderly workers after job displacement. They find that elderly workers above 50 face significantly higher non-employment rates even five years after displacement – compared to younger cohorts.

² Additionally, employers got a bonus in the form of reduced social security contributions if they hired older workers.

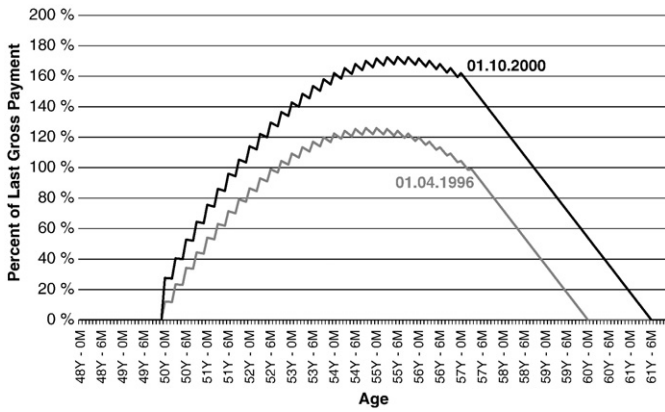


Fig. 1. Layoff tax for male workers in percent of last gross income.

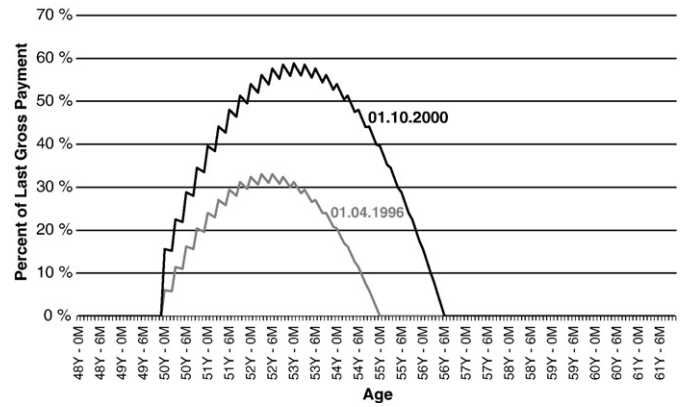


Fig. 2. Layoff tax for female workers in percent of last gross income.

similar legislation in Germany, where hiring subsidies for the employment of elderly workers were given.

The introduction of this Austrian regulation in 1996 and a change in 2000 form two quasi-experimental situations. As we are able to observe the universe of Austrian workers we can use a difference-in-difference framework using cohorts relatively close to the 50 year threshold. Different details of the legislation in terms of tenure requirements and the amount of the tax allow some additional approaches to identify the effect of this legislation on layoff behavior of firms. We use information on the complete workforce of the firms to investigate potential substitution effects of the legislation.

2. Austrian pension system and layoff tax

2.1. The pension system

Austria has a very generous but also expensive pension system. While the regular retirement age (65 years for men and 60 years for women) is similar to other countries, the average actual retirement age of workers decreased from 61.9 in 1970 to 58.4 in 1999 for men and from 60.4 to 56.7 for women (*Hauptverband der österr. Sozialversicherungsträger, 2000*, ch. 3, p. 7). Workers could choose to go for early retirement 5 years before the regular retirement age (i.e. 55 years for women and 60 years for men) when they have contributed to the public pension insurance for a long time ('early retirement due to long term on an insurance'). In addition to this, disability pensions are another form of early retirement, which accounts for 13% of the awarded pensions and 19.5% of all retirees in 1999 (*Hauptverband der österr. Sozialversicherungsträger, 2000*, ch. 3, p. 3).

After a change in the government in the year 2000, the new government decided to reform the pension system. As a part of that reform the layoff tax of 1996 was increased sharply. The minimum retirement age was increased by 18 months for men and for women. In addition to this, the reform introduced restrictions for claiming disability pensions, where it was ruled out to claim disability pension due to reduced working ability below the age of 57.

Private or employer-provided occupational pensions basically do not exist in Austria (*Brunner et al., 2005*). Workers leaving a firm were entitled to severance payment by the employer. This severance payment has to be paid in any case where the worker does not quit voluntarily, which includes leaving into retirement. It increases from two monthly salaries after three years of tenure stepwise up to a yearly salary after 25 years of tenure. This forms a strong incentive for high tenured (elderly) workers not to quit voluntarily.

2.2. The layoff tax

The layoff tax became effective in April 1996. If an employee is older than 50 years and has been continuously employed for more

than 10 years by one employer, a period which may include breaks less than a year, the employer has to pay a tax when he gives notice. There is no tax in case of a voluntary quit initiated by the worker, if the contract was suspended in mutual agreement with the employee or a dismissal was based on serious misconduct by the employee. In October 2000, this layoff tax was sharply increased by a new social security law reform.

As the tax is designed to internalize the costs to the social security administration in case of a layoff, it depends on the age of the worker, the number of months until the earliest possible retirement and the monthly gross income of the dismissed employee.

$$\text{tax}(\text{age}) = (\text{retirement age} - \text{age}) * \text{baserate}(\text{age}) * \text{monthly income}.$$

Figs. 1 and 2 display the layoff tax for male and female employees as a percentage of monthly income. Both the original tax of 1996 and the reform of 2000 are shown. Due to the intention of the law we see an inverse U-shape of the tax, which is the result of a phasing in of the tax together with an alleviating effect due to the approaching of the early retirement age: the closer a dismissed person is to regular retirement age, the lower will be the cost to the unemployment benefit system and the lower the corresponding tax. For all age groups the tax is lower for women as compared to men; both in the first regime as well as in the reform regime.³ The increase due to the reform is relatively sharper, though: the maximum tax rate has been increased by approximately one third (37%) for men while it was nearly doubled for women (78%).

As the size of the tax varies heavily with the age of the worker, we will take up this issue in the evaluation.

3. Data

The Austrian social security database (ASSD, *Zweimüller et al., 2009*) consists of matched administrative records. It contains detailed information about *employment*, *unemployment*, long term sickness, etc. at the individual level; the data are matched from Social Security records and records from the Employment Office. The data set covers all information for the years 1972 to 2001 for *all workers in Austria* excluding public servants.

For the empirical analysis we look at quarterly layoff rates. For each reference date in a quarter (February 10, May 10,...) we collect a sample of employed persons fulfilling the following conditions:

³ This is due to different early retirement ages (men 60 years in 1996 and 61.5 years in 2000; women 55 years in 1996 and 56.5 years in 2000).

Table 1
Descriptive statistics about job status (by age categories).

	Overall	45–47.5	47.5–50 ^a	50–52.5	52.5–55	55–57.5	57.5–
1996							
Men							
Individuals	128,924	37,639	18,532	23,681	24,201	17,560	7311
Quarters (avg)	6.26	5.82	6.32	6.98	6.83	6.40	3.85
Displaced	1.10%	0.85%	0.85%	0.87%	1.03%	1.34%	2.51%
Retired	0.65%	0.05%	0.09%	0.15%	0.39%	1.52%	3.50%
Other quits	2.70%	2.50%	2.69%	2.66%	2.94%	2.80%	2.50%
Women							
Individuals	66,349	37,755	19,218	24,006	19,693		
Quarters (avg)	5.71	5.78	6.14	6.72	3.84		
Displaced	1.66%	1.19%	1.27%	1.59%	2.70%		
Retired	0.40%	0.05%	0.09%	0.16%	1.38%		
Other quits	2.34%	2.24%	2.27%	2.44%	2.44%		
2000							
Men							
Individuals	131,020	51,680	25,641	32,587	23,173	22,492	19,390
Quarters (avg)	6.00	5.58	6.25	6.85	6.70	6.35	3.80
Displaced	1.01%	0.72%	0.76%	0.83%	0.90%	1.19%	2.13%
Retired	0.56%	0.04%	0.07%	0.13%	0.30%	1.33%	2.31%
Other quits	2.71%	2.41%	2.56%	2.73%	2.97%	3.16%	2.39%
Women							
Individuals	64,001	37,694	19,274	24,243	21,240		
Quarters (avg)	5.67	5.55	6.04	6.59	4.05		
Displaced	1.41%	1.00%	1.14%	1.34%	2.24%		
Retired	0.14%	0.04%	0.07%	0.14%	0.33%		
Other quits	2.60%	2.34%	2.45%	2.76%	2.88%		

The relative displacement probabilities are calculated for all eight quarters together. (i.e. 4 quarters before and 4 quarters after the introduction/change of the layoff tax).

^a This category does not include 49.75–50 year old workers (see later).

tenure with the firm longer than 10 years, age at the reference date between 45 and 60 for men and between 45 and 55 for women.⁴

For these workers we construct categorical variables to determine the employment status for a period of three months after the reference date. We look at the change of the employment status of each worker and determine whether he or she is still working for the same employer, voluntarily left the firm, left into retirement or left due to other reasons. As usual in administrative data sets, the reason why a worker left his or her firm is not coded. Involuntary dismissals can be identified due to unemployment benefit regulations: workers who quit voluntarily or with mutual agreement do not have any benefit claims in the first 4 weeks after leaving the firm, whereas those involuntarily dismissed can start their claims on the first day.

3.1. Descriptives

Table 1 shows simple descriptive statistics of the overall population of workers in Austria. Overall about 130,000 male and 65,000 female workers were employed (longer than 10 years) during both periods.

Only employees with a tenure of more than 10 years are protected by the law. Among them, a male worker is employed on average 6.26 (6.00) periods over all 8 observed periods (4 quarters before and after the policy change) in 1996 (2000). Female employees remain on average 5.71 (5.67) periods in the sample in 1996 (2000).

Age specific displacement rates are rising with age both for men and women. The share of workers who leave the firm for other reasons – mainly voluntary quits is in general somewhat higher than the share of displaced workers, but has no relation to age. The share of retiring workers is comparably small, but increases with age.

⁴ We exclude workers employed in construction and tourism due to a very high temporary layoff phenomenon as well as all non-civil servant employees in the public sector as well as in the transport sector (public railway system) because these workers enjoy unusually high employment protection.

4. Evaluation

As the effects of the layoff tax on hiring can be ruled out due to the tenure rule, we concentrate on the displacement of workers. Using the universe of Austrian workers, we look at a period of four quarters before and four quarters after the introduction or the change of the layoff tax and use quarterly layoff rates. If a registered worker changes to a recipient of unemployment benefits within four weeks after leaving paid employment, we consider him or her as being laid off in the sense of the regulation.

If it could be assumed that one can precisely estimate the effect in an arbitrarily small neighborhood of the threshold – around age 50 of the workers – then a regression discontinuity approach would be the method of choice. In our case layoff probabilities will diverge on both sides of the threshold because of the possibility of substituting potential layoff victims with workers with different but similar characteristics.

For these reasons, we use a difference-in-difference (DD) approach to study changes in the layoff probabilities of workers farther away from the threshold. The policy evaluation relies on variation between the birth cohorts over time, because the layoff taxes differ in various ways according to age.⁵ The abovementioned, possible divergence of layoff probabilities could bias the DD estimator in a similar manner, therefore, we do not include workers too close to the threshold of 50 years in our sample, i.e. we exclude workers aged between 49 years and 9 months (49.75 years from now on) and 50 in the control group. In addition to this, we evaluate the effect of the tax using a different control group aged 45–47 years to check for robustness of the estimates.

⁵ Taking into account that firms only have to pay the layoff tax for workers who were employed for more than 10 years, tenure could have been added as another threshold to the analysis. Due to data problems, job tenure in a firm can only be bounded from below: if the worker stays in the same firm, tenure can unambiguously be calculated, if the worker switched to another job within a corporation, actual tenure – which is relevant for the application of the law – might be higher.

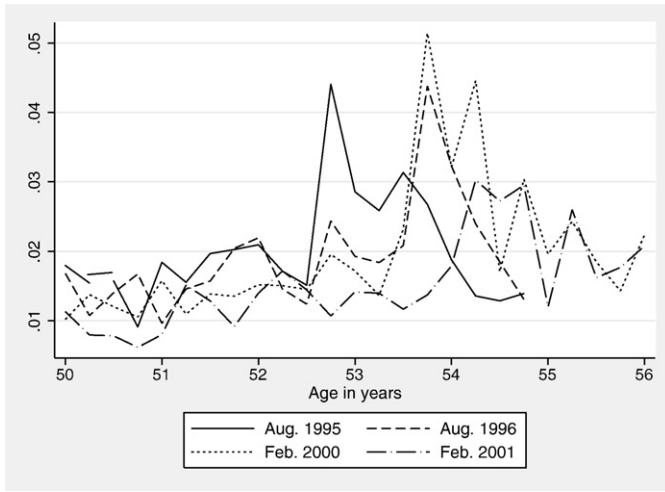


Fig. 3. Layoff probabilities for women.

Figs. 3 and 4 show layoff probabilities for women and men according to age for the years before and after the introduction and change of the law. The peak in layoff probability for higher age groups is persistent, it shifts a bit to the right over the years, though.

First, the age dimension of the data can be separated into two groups. The cohorts aged between 45 and 49.75 are the control group. Using workers aged between 49.75 and 50 years would be inappropriate because they would change to treatment status during the observation period of a quarter.

Apart from comparing all workers aged 50 and above with the control group we can also study separate effects for different age groups. Figs. 5 and 6 show the time pattern of displacement probabilities more clearly. The introduction of the regulation in 1996 as well as the change in 2000 is indicated by vertical lines. We see a strong seasonal pattern of layoff rates. While the introduction of the law in 1996 does not seem to have influenced layoff patterns both for women and men, the change of the law in 2000 led to a markable reduction in layoffs.

4.1. Empirical results

At first we use a simple difference-in-difference probit model to compare the displacement probability of our treatment group aged 50 and above with the control group below the threshold. To calculate marginal effects we use the method proposed in Ai and Norton (2003)

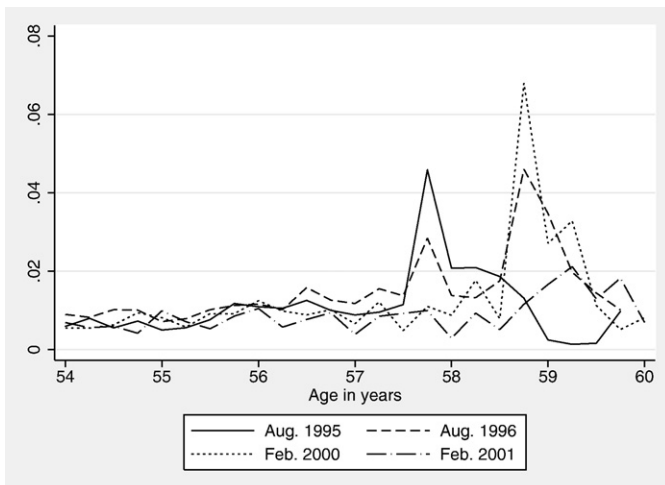


Fig. 4. Layoff probabilities for men.

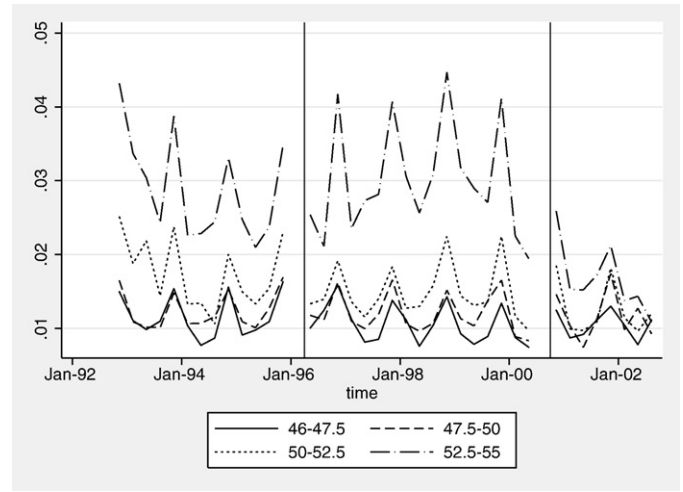


Fig. 5. Layoff probabilities for women over time.

for difference-in-difference estimates in a nonlinear case. In a first DD model we include only seasonal dummies and the variables to estimate the DD effect:

$$P(D) = \Phi(\beta X + \alpha_1 I(\text{after}) + \alpha_2 I(\text{age} > 50) + \alpha_3 I(\text{after})I(\text{age} > 50)). \quad (1)$$

In a second DD model we include additional covariates to describe the characteristics of the employee, the employment spell and the firm. We include age, citizenship and tenure dummies as characteristics of the employee, firm size and dummies for the type of economic activity (10 groups) as characteristics of the firm. Finally, we take work experience, a dummy indicating blue collar work and the log wage rate as characteristics of the employment spell. The third model uses all these covariates and additionally allows for age specific treatment effects of the regulation.

The simple DD model in Table 2 reproduces the visual results of Figs. 6 and 5 as discussed above. The introduction of the tax in 1996 seems to have a perverse effect of increasing displacement in the treatment group. After including covariates this effect vanishes and only the negative effects of the increase of the layoff tax in 2000 remain significant.

The estimated effects are both economically and statistically significant. A reduction of 0.28 percentage points of the displacement rate of male workers amounts to more than 25% of the real displacement rate of 1.01% of this group. The displacement rate of the elderly female workers (1.41%) was reduced by a third or 0.47 percentage

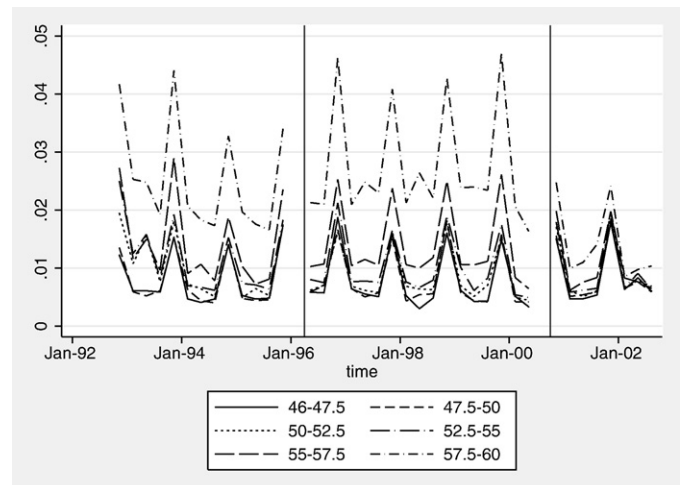


Fig. 6. Layoff probabilities for men over time.

Table 2
DD estimates on the effect of layoff taxes on the probability of layoff.

		Men				Women			
Year		1996	1996 ^a	2000	2000 ^a	1996	1996 ^a	2000	2000 ^a
Displacement ^b		1.10		1.01		1.66		1.41	
Simple DD ^c		0.10** (0.04)	0.08* (0.05)	-0.32*** (0.04)	-0.32*** (0.04)	-0.01 (0.08)	-0.05 (0.09)	-0.45*** (0.07)	-0.51*** (0.08)
DD		0.04 (0.04)	0.03 (0.05)	-0.28*** (0.04)	-0.29*** (0.04)	-0.08 (0.07)	-0.15 (0.08)	-0.47*** (0.07)	-0.55*** (0.08)
50.0–52.5	Disp. ^b	0.87		0.83		1.59		1.34	
	DD	-0.22*** (0.05)	-0.23*** (0.05)	0.07 (0.05)	0.07 (0.05)	-0.28*** (0.10)	-0.34*** (0.11)	0.34*** (0.10)	0.30*** (0.10)
52.5–55.0	Disp. ^b	1.03		0.90		2.70		2.24	
	DD	-0.08 (0.05)	-0.08 (0.06)	0.00 (0.05)	0.00 (0.05)	0.19* (0.11)	0.14 (0.12)	-0.83*** (0.11)	-0.87*** (0.11)
55.0–57.5	Disp. ^b	1.34		1.19					
	DD	0.09 (0.06)	0.08 (0.08)	-0.27*** (0.07)	-0.28*** (0.07)				
57.5–60.0	Disp. ^b	2.51		2.13					
	DD	0.63*** (0.14)	0.62*** (0.14)	-1.32*** (0.11)	-1.32*** (0.11)				
Obs		[806,955]	[695,696]	[785,535]	[681,331]	[378,552]	[306,243]	[362,702]	[295,912]
Workers		128,881	126,519	130,883	128,394	66,319	64,468	63,900	61,901

All DD estimates are marginal effects of a clustered probit regression, printed in percentage points. Other variables are: age, citizenship, yearly tenure dummies, firm size and dummies for the type of economic activity (10 groups), work experience, a dummy indicating blue collar work and the log wage rate. *, **, *** indicate significance at the 10%, 5% and 1% levels.

^a Different control group of workers aged 45 to 47.

^b Mean displacement probabilities in treatment cohort.

^c Simple DD is calculated including only seasonal dummies.

points. It seems that the amount of the tax at the introductory stage was too small to induce any significant changes in behavior.

Using the alternative control group aged 45–47 to control for a possible divergence of the layoff probabilities near the threshold of 50, the estimates for the effects of the layoff tax do not differ in both the value and the significance level. This test suggests that the applied method is very robust.

Using the age specific treatment model, we see that the major effect is driven by the reduction in displacement for the oldest group of workers.⁶ In 1996 with the introduction of the tax, we see reductions in layoff rates for the lowest age groups but significant increases for the oldest men (57.5-) and the oldest women (52.5-) in our sample. As the amount of the tax was rather small – 20–40% of one monthly income – unexpected behavioral responses by firms could be responsible: If there is a social norm not to fire elderly workers due to fairness concerns or implicit contracts, (too) small monetary incentives could backfire: a layoff tax could make the social norm obsolete because the firing tax has been paid anyway – making thus firing of elderly workers socially acceptable (Gneezy and Rustichini, 2000).⁷

After the tax was increased in 2000, we generally find more negative effects and the strongest reductions in layoff rates for the oldest workers in our sample. One way to interpret our results would be to compare the situation of the high layoff tax – as of the year 2000 – with a situation without a tax at all. Due to the longer time span of over four and a half years between the introduction and raising of the tax a direct DD estimation strategy is not advisable. A rough summing up of the two effects (1996 and 2000) in Table 2 shows that behavioral effects due to social norms can be ruled out: comparing the situation without a tax with the situation with the highest tax in the year 2000, layoff rates in almost all age groups got reduced.

⁶ Note that we restrict our samples to workers below age 60 for men and below age 55 for women to be able to distinguish our effects from the effects of retirement age increases in 2000, which affected only workers above that age.

⁷ See also Winter-Ebmer (2003) for an implicit contracts explanation of firing behavior among Austrian firms.

5. Does substitution matter?

While the introduction and in particular the increase of the layoff tax up to two monthly wages directly reduced layoff rates of tax-eligible workers of these firms, other effects of this legislation on layoff behavior of firms are possible as well. The introduction of such a firing tax will leave firms with a suboptimal number and structure of their workforce. Firms might therefore react to these constraints by some sort of substitution. First, as the tax is payable only if the worker is laid off but not in the case of a quit initiated by the worker, the firm could use different means to mob or bribe the worker to leave the firm “voluntarily”. Second, the firm can try to substitute away from the type of worker which would be taxed to a very similar type of worker not subject to the tax, i.e. younger workers. While the first coping strategy requires the study of all exit routes by workers leaving the firm, substituting away from “taxable” workers can be studied by looking at turnover rates of whole firms.

5.1. Using other exit routes

We use multinomial logit models to analyze the first type of substitution which happens at the individual level: if an older worker whose layoff is taxable is to be made redundant, several forms of exits are possible: a taxable layoff, an induced “voluntary quit” and an induced early retirement by means of invalidity pension, etc. If taxable layoffs are substituted by non-taxable ones, we should see an increase in the exit rates for pensions and voluntary quits due to the layoff tax.

In Table 3 we use a multinomial logit model to take three exits routes into account: (early) retirement, layoff and other (mainly voluntary) quits. The base category of all these models is still working for the firm. We see that the large negative impact of the layoff tax in the year 2000 for both women and men is consistent with the previous results. We see some evidence of an increase in voluntary quits in the year 1996, both for men and women which could be explained by a substitution phenomenon.

Table 3
DD estimates of different exit categories: multinomial logit model.

	Simple DD			DD ^a		
	Pensions	Other quits	Layoff	Pensions	Other quits	Layoff
<i>Women</i>						
1996	-0.874*** (0.039)	-0.207** (0.101)	-0.006 (0.082)	-0.368*** (0.049)	0.191*** (0.072)	-0.083 (0.058)
	[378,744] 66,349 workers			[378,552] 66,319 workers		
2000	-0.024 (0.024)	-0.081 (0.096)	-0.448*** (0.061)	-0.018 (0.016)	-0.107 (0.080)	-0.408*** (0.060)
	[363,046] 64,001 workers			[362,702] 63,900 workers		
<i>Men</i>						
1996	-0.356*** (0.030)	0.158** (0.078)	0.095** (0.039)	0.102*** (0.019)	0.268*** (0.060)	0.020 (0.034)
	[807,340] 128,924 workers			[806,955] 128,881 workers		
2000	-0.472*** (0.024)	-0.103 (0.077)	-0.306*** (0.040)	-0.086*** (0.019)	0.063 (0.063)	-0.227*** (0.026)
	[786,240] 131,020 workers			[785,535] 130,883 workers		

All DD estimates are marginal effects of the interaction term in a multinomial logit regression presented in percentage points. Significance levels and standard errors (in parenthesis) calculated using bootstrapping methods. No. of observations in brackets.

^a DD with covariates (seasonal dummies (3), blue collar worker dummy, firm size, sector dummies (7), tenure dummies (15+), wage, experience, age dummies (8+), Austrian citizenship dummy).

5.2. Dismissing other workers?

If the layoff tax makes layoffs of the specially protected group of workers more expensive, the employer could decide to lay off similar personnel instead. The firm could easily choose a worker whose age is slightly below the threshold. One way to test for this phenomenon is to use the complete firing behavior of firms. Under usual circumstances it cannot be tested if the layoff tax reduced firing of “taxable” persons and at the same time increased firing behavior of some other group because there is no control group anymore. As we can observe the full layoff patterns of all Austrian firms we can come up with a novel idea of a control group: The firing behavior of firms having no workers who are eligible for the firing tax among their personnel should not be influenced by the introduction of the tax.

In the following we look at the number of dismissed workers by firm as our dependent variable. We focus on two different outcomes: first, the total number of layoffs of older tenured workers (aged 45+), and, second, the number of layoffs of all types of non-tax-eligible workers, i.e. tenured and below age 50. As we can observe changes in the workforce composition for whole firms we can estimate models at the firm level as well. A difference-in-difference framework in this respect will show the differential layoff behavior of firms who should be affected by the tax relative to firms who – due to their workforce composition – could not possibly be affected by the layoff tax; i.e. firms that have no tax-eligible workers in their workforce. The identifying assumption here is that the development of the number of layoffs in treated and control firms is the same over time. Substitution effects – i.e. increased layoff of non-eligible workers – can be identified by a positive coefficient for non-eligible workers. The difference-in-difference effect for all workers can – in turn – be interpreted as the overall effect of the law on the headcount.

Due to the count data aspect of the number of layoffs in a particular firm and quarter we use a negative binomial regression model.⁸ In Table 4 we can see that firms employing eligible workers show, consistently with the previous results, no significant reaction to the

⁸ If we would neglect the differences in firm size our regression estimates would be biased, since a negative binomial model assumes all firms to have the same number of employees in the risk groups. We account for these differences by adding the log of firm size as a measure of exposure with its coefficient constrained to one.

Table 4
DD estimates at the firm level.

Types	1996	2000	2000	
	Non-eligible	All	Non-eligible	All
Layoffs ^a	0.0385	0.0703	0.0347	0.0634
DD ^b	0.0006 (0.00078)	0.0001 (0.00074)	0.0015** (0.00077)	-0.0017** (0.00073)
Obs	[142,685]	[234,195]	[133,984]	[222,730]
Firms	24,162	36,530	23,714	35,939
χ^2	1810.82	3061.84	1933.31	3345.98
<i>DD^b estimates by firm size categories</i>				
Firm size 1–5 (44.5% of firms)	-0.0004 (0.00298)	-0.0018 (0.00151)	-0.0010 (0.00293)	-0.0040*** (0.00146)
Firm size 6–10 (19.3% of firms)	-0.0018 (0.00213)	-0.0008 (0.00167)	-0.0015 (0.00200)	-0.0030* (0.00160)
Firm size 11–20 (15.3% of firms)	-0.0008 (0.00186)	-0.0024 (0.00330)	0.0020 (0.00173)	-0.0019 (0.00328)
Firm size 21–50 (11.6% of firms)	-0.0014 (0.00402)	-0.0075 (0.00846)	-0.0022 (0.00434)	-0.0135 (0.00885)
Firm size 51– (9.3% of firms)	0.0037 (0.01757)	0.0102 (0.04668)	0.0197* (0.01046)	0.0309 (0.03198)

Negative binomial regression of quarterly firm-specific layoffs. Control variables include: relative share of blue collar workers, relative share of female workers, median wage, regional dummies (8), seasonal dummies (3), firm size dummies (15) and dummies for sectors (7). *, **, *** indicate significance at the 10%, 5% and 1% levels.

^a Mean number of laid off workers in a firm per quarter.

^b Marginal effect of layoff tax on firm-specific layoff rates calculated at the means of covariates and median firm size (exposure). Control group are firms without workers eligible for the tax.

regulation in 1996. There is also no sign of a substitution w.r.t. non-eligible workers. In contrast to this, for the increase of the tax in 2000 we see a decrease in the total number of layoffs by 0.0017 per firm and quarter. Likewise, we find an increase in layoffs for non-eligible workers by nearly the same amount (0.0015). We can interpret these findings as follows: the layoff tax seems to reduce the layoff of eligible workers, but about one half of this effect is substituted with an increase of non-taxable dismissals.

Firm size is an important determinant in this evaluation exercise: as the treatment-control comparison hinges upon the presence of tax-eligible and non-eligible workers in one firm, it might be difficult to find very large firms, where no non-eligible workers are among the workforce making thus comparisons for large firms difficult. On the other hand, substitution processes might be easier for large firms: among a large group of workers, finding a handy substitute for a tax-eligible worker is not so difficult. In the lower panel of Table 4 we present difference-in-difference estimates for five firm size groups. Due to the small-firm structure of the Austrian economy four groups cover rather small firms – up to 50 workers. Both for 1996 and the year 2000 we see consistently negative effects of the layoff tax on total employment in these firms below 50 – albeit these effects are only significant for the two smallest firm size categories in the year 2000. On the other hand, all effects for non-tax-eligible workers are insignificant, most point estimates are even negative as well. These results confirm the hypotheses that the tax is in fact binding for small firms, due to a mere lack of suitable substitution candidates. Only in the biggest firm size category – firms with more than 50 workers – we do find substitution in the year 2000. Here, dismissal rates of non-tax-eligible workers go up, leaving total employment in these firms largely unchanged. Notice that due to the small number of control groups in the largest firm size category standard errors in this category are much larger; this research strategy is thus less suitable for this group of very large firms.⁹

⁹ Comparing the size of the coefficients across firm size categories is misleading, as we are measuring the average number of laid off workers which should obviously be higher in large firms.

6. Conclusions

In 1996 Austria introduced a layoff tax which was meant to reduce the firing of elderly worker – unemployment entries which involve high costs to the social security administration due to long unemployment benefit periods and a prevalence of early retirement. As the initial amount of the tax was rather low, no effects on layoff rates could be observed – which might be due to a crowding out of social norms by too small financial incentives. After increasing the tax, layoff rates – in particular for the group of the oldest workers – decreased significantly.

Selective employment protection measures can often lead to perverse effects when firms try to avoid the tax by reduced hiring or substitution processes. We use two methods to check if firms use such substitution strategies. Mobbing or bribing could be used to get rid of workers without formally laying them off – by inducing them to quit voluntarily. In the data we do not find much evidence for firms using such tactics.

Most firms in Austria are very small; for these firms we do not find any substitution effects. This might be due to indivisibility problems or the simple fact that with only a hand full of workers of a certain qualification and the necessary age around it may be impossible to find suitable non-tax-eligible workers which could act as substitutes for the protected older workers. The situation is different for large firms. Here the advantage for elderly workers is thwarted by substitution effects. These unbalanced reactions of firms are certainly troublesome for the policy maker: due to the non-availability of evasion strategies only small firms internalize the higher costs to the social insurance administration. Larger firms are advantaged and might gain some market share.

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