



Layoff Tax and the Employment of the Elderly

by

Mario Schnalzenberger and Rudolf Winter-Ebmer

Working Paper No. 0804

November 2008

Supported by the
Austrian Science Funds

FWF

**The Austrian Center for Labor
Economics and the Analysis of
the Welfare State**

JKU Linz
Department of Economics
Altenberger Strasse 69
4040 Linz, Austria
www.laborrn.at

mario.schnalzenberger@jku.at
phone +43 (0)70 2468 -8332, -8217 (fax)
rudolf.winterebmer@jku.at
phone +43 (0)70 2468 -8236, -8217 (fax)

Layoff Tax and the Employment of the Elderly *

Mario Schnalzenberger and Rudolf Winter-Ebmer
Department of Economics
Johannes Kepler University Linz, Austria

November 10, 2008

*Thanks to participants at seminars in Linz, ESPE, London and EALE, Amsterdam for helpful comments and the Austrian Science Funds (NRN Labor Economics and the Welfare State) for funding.

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 percent 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.

Keywords: Layoff tax, labor demand, employment, elderly workers.

JEL classification: J14, J45, J63

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 im-

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.

portant 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 behaviour 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 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 percent of the awarded pensions and 19.5 percent 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 1999 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 only if the worker did not quit voluntarily or leaves 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 voluntary.

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.

$$tax(age) = (retirement\ age - age) * baserate(age) * monthly\ income$$

Figures 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 percent) for men while it was nearly doubled for women (78 percent).

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. (2008)) 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 concentrate on 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: 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 layoff rates for a period of three months after the reference date. As many workers are not laid off, but quit their job voluntar-

³This 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).

⁴We 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.

ily, we also construct a probability that the worker quits for 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 175,000 male workers were employed (longer than 5 years) during both periods.

Only employees with a tenure of more than 10 years are protected by the law. Amongst 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 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 - than 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

Figures 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

⁵Taking 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.

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 in two groups. The cohorts aged between 45 and 49 years and 9 months (49.75 years from now on) are the control group. Using workers aged between 49.75–50 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 aged between 45 and 49.75 we can also study separate effects for different age groups. Figures 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 are 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) 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:

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

In a second DD model we include 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 a 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 the Figures 6 and 5 as discussed above. The introduction of the tax in 1996 seems to have an 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. The reduction of 0.28 percentage points of the displacement rate of male workers amounts to more than 25 percent of the real displacement rate of 1.1 % of this group. The displacement rate of the elderly female workers (1.41 %) was reduced by a third or 0.47 percentage points. It seems that the amount of the the tax at the introductory stage was too small to induce any significant changes in behavior.

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 the 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

⁶Note 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.

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 (Gneezy and Rustichini (2000)).⁷

After the tax was increased in 2000, we find generally 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 higher layoff tax - as of the year 2000 - with a situation without a tax. Due to the longer time span of the introduction and raising of the tax over four and a half year a direct estimation strategy is not possible. A rough summarizing of the two effects in 2 we see that we can rule out behavioral effects due to social norms: 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.

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 the 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

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

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 or less tenured 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 analyse 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.

5.2 Dismissing Other Workers?

If the layoff tax makes layoffs of the specially protected group of workers more expensive, the employer could decide instead to lay off similar personnel. The

firm could easily choose someone with less tenure or 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 regular 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: 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 quarterly dismissal rates of firms. We can look at two different outcomes: first, the total number of layoffs of older workers (aged 45+), and, second, the number of layoffs of all types of non-tax eligible workers, i.e. below age 50 or less tenured workers. As whole firms' behavior in terms of workforce composition can be observed we can estimate models at the firm level. 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. The identifying assumption here is that the development of layoff rates of treated and control firms is the same over time. Substitution effects - i.e. increased layoff of other 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.

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

⁸If 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. We

firms employing eligible workers show, consistently with the previous results, no significant reaction to the regulation in 1996. There is also no sign of a substitution on 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 0.0013 per firm and quarter. Likewise, we find an increase in layoffs for non-eligible workers by the same amount. 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.

6 Conclusions

In 1996 Austria introduced a layoff tax which was meant to reduce the firing of elderly workers. 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 strategies to check if firms use such substitution strategies. Mobbing or bribing could be two strategies to get rid of workers without formally laying them off - by inducing them to quit voluntarily. In the data we do not find evidence for such strategies. While we see some evidence that firms do change their firing behavior by increasing the firing of non-taxable workers - i.e. younger or non-tenured workers; the general pattern of the tax remains still valid.

account for these differences by adding the log of firm size as a measure of exposure with its coefficient constrained to one.

References

- Acemoglu, Daron and Joshua D. Angrist**, “Consequences of Employment Protection? The Case of the Americans with Disabilities Act,” *Journal of Political Economy*, 2001, 109 (5), 915–957.
- Ai, Chunrong and Edward C. Norton**, “Interaction terms in logit and probit models,” *Economics Letters*, July 2003, 80 (1), 123–129.
- Behaghel, Luc, Bruno Crepon, and Beatrice Sedillot**, “The perverse effects of partial employment protection reform: The case of French older workers,” *Journal of Public Economics*, April 2008, 92, 696–721.
- Boockmann, Bernhard, Andreas Ammermueller, Thomas Zwick, and Michael B. Maier**, “Do Hiring Subsidies Reduce Unemployment Among the Elderly? Evidence From Two Natural Experiments,” 2007. ZEW Discussion Paper No. 07-001, Mannheim.
- Brunner, Johann, Cornelia Riess, and Rudolf Winter-Ebmer**, “Public and Private Pension Claims,” in Axel Börsch-Supan and Hendrik Jürges, eds., *Health, Ageing, and Retirement in Europe*, MEA Mannheim, 2005, pp. 241–245.
- Gneezy, Uri and Aldo Rustichini**, “A Fine is a Price,” *Journal of Legal Studies*, 2000, 29 (1), 1–18.
- Hauptverband der österr. Sozialversicherungsträger**, “Statistisches Handbuch der österreichischen Sozialversicherung 2000,” October 2000.
- Hernanz, Virginia, Adriana Kugler, and Juan F. Jimeno**, “Employment Consequences of Restrictive Permanent Contracts: Evidence from Spanish La-

bor Market Reforms,” IZA Discussion Papers 657, Institute for the Study of Labor (IZA) November 2002.

Ichino, Andrea, Guido Schwerdt, Rudolf Winter-Ebmer, and Josef Zweimüller, “Too Old To Work, Too Young To Retire?,” 2006. Universität Linz, mimeo.

Kugler, Adriana and Giovanni Pica, “Effects of Employment Protection on Worker and Job Flows: Evidence from the 1990 Italian Reform,” Working Paper 11658, National Bureau of Economic Research October 2005.

Organisation for Economic Co-operation and Development, *Ageing and Employment Policies: Live Longer, Work Longer*, Paris: OECD publishing, 2006.

Winter-Ebmer, Rudolf, “Benefit Duration and Unemployment Entry: Quasi-Experimental Evidence for Austria,” *European Economic Reviews*, April 2003, 47 (2), 259–273.

Zweimüller, Josef, Rudolf Winter-Ebmer, Rafael Lalive, Andreas Kuhn, Oliver Ruf, and Jean-Philippe Wuellrich, “The Austrian Social Security Database (ASSD),” 2008. IEW Working Paper, University of Zurich.

Figure 1: Layoff Tax for Male Workers in Percent of Last Gross Income

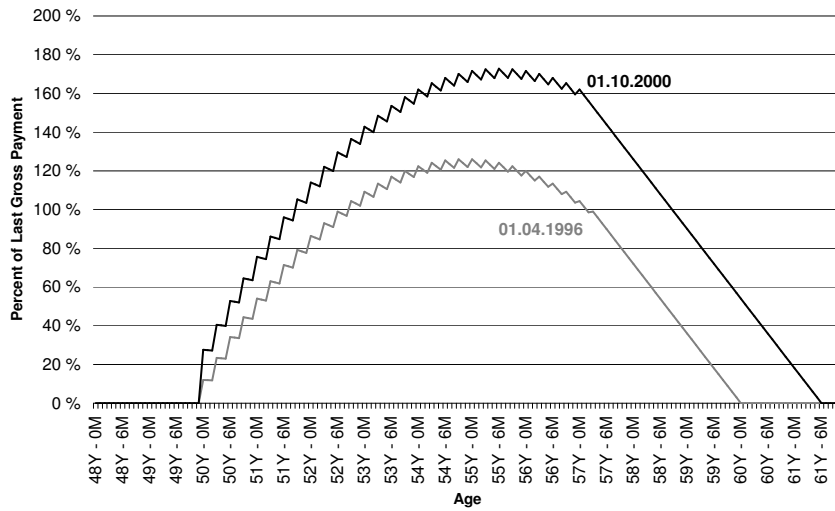


Figure 2: Layoff Tax for Female Workers in Percent of Last Gross Income

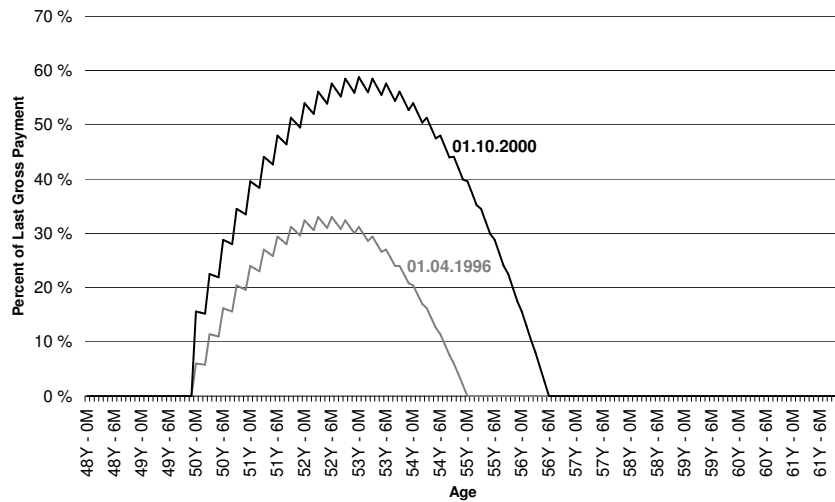


Figure 3: Layoff Probabilities for Women

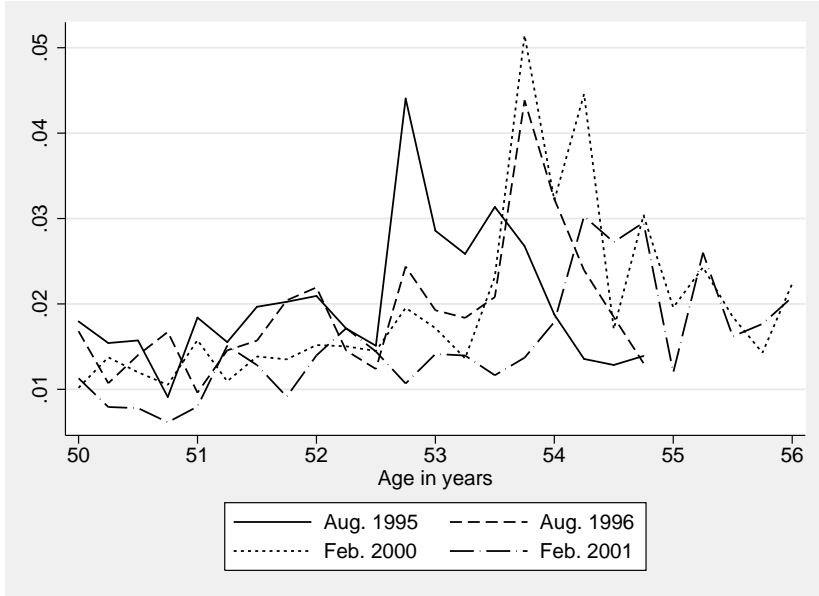


Figure 4: Layoff Probabilities for Men

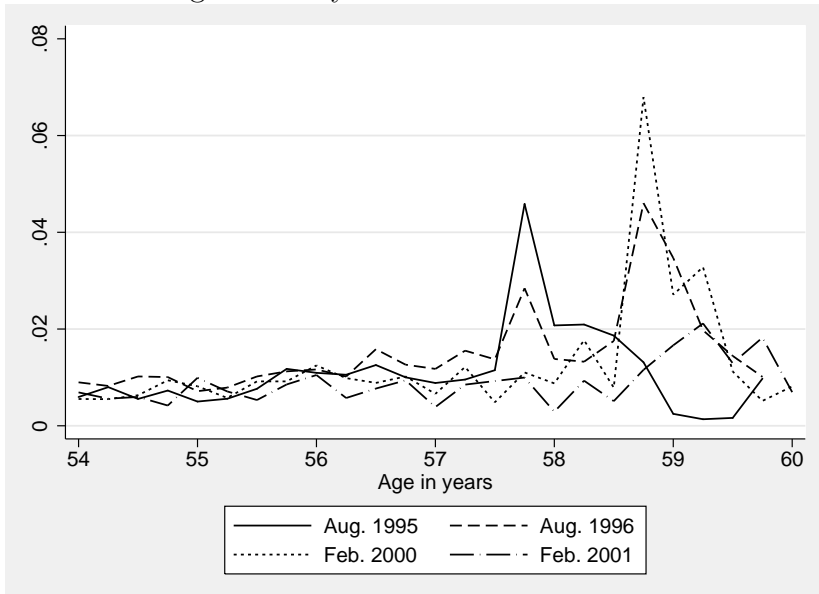


Figure 5: Layoff Probabilities for Women Over Time

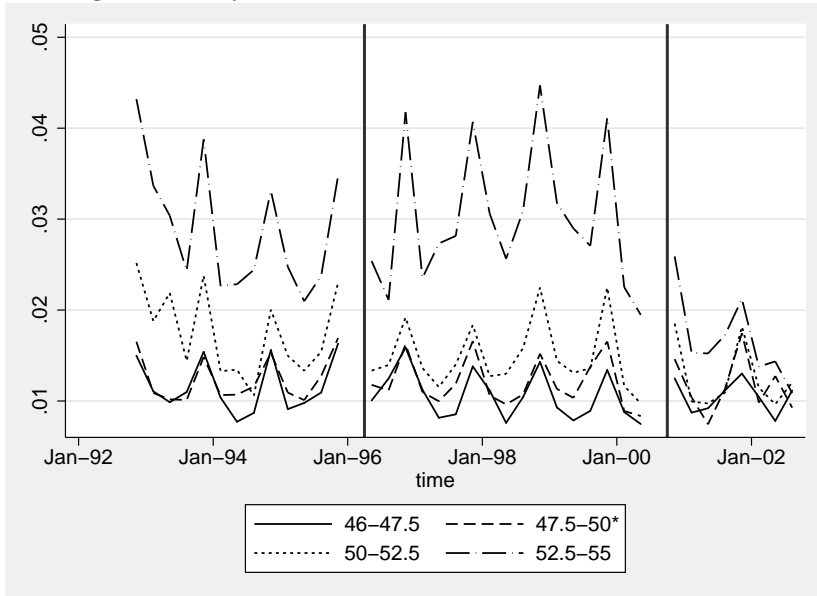


Figure 6: Layoff Probabilities for Men Over Time

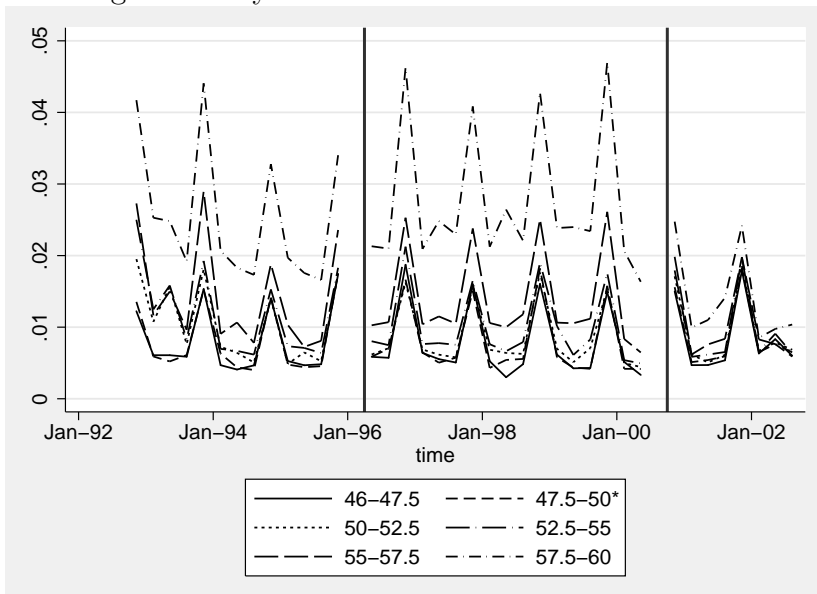


Table 1: Descriptive Statistics About Job Status (By Age Categories)

| | Overall | 45–47.5 | 47.5–50 ^a | 50–52.5 | 52.5–55 | 55–57.5 | 57.5– |
|----------------|---------|---------|----------------------|---------|---------|---------|--------|
| 1996 | | | | | | | |
| <i>Men</i> | | | | | | | |
| Individuals | 128,924 | 37,639 | 18,532 | 23,681 | 24,201 | 17,560 | 7,311 |
| 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 % |
| <i>Women</i> | | | | | | | |
| 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 | | | | | | | |
| <i>Men</i> | | | | | | | |
| 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 | 2.71 % | 0.04 % | 0.07 % | 0.13 % | 0.30 % | 1.33 % | 2.31 % |
| Other Quits | 0.56 % | 2.41 % | 2.56 % | 2.73 % | 2.97 % | 3.16 % | 2.39 % |
| <i>Women</i> | | | | | | | |
| 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 % | | |

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

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)

Table 2: DD Estimates on the Effect of Layoff Taxes on the Probability of Layoff

| | Year | Men | | Women | |
|---------------------------|------|--------------------|--------------------|--------------------|--------------------|
| | | 1996 | 2000 | 1996 | 2000 |
| Displacement ^a | | 1.10 | 1.01 | 1.66 | 1.41 |
| Simple DD ^b | | 0.10** (0.04) | -0.32*** (0.04) | -0.01 (0.08) | -0.45*** (0.07) |
| DD | | 0.04 (0.04) | -0.28*** (0.04) | -0.08 (0.07) | -0.47*** (0.07) |
| 50.0 – 52.5 | | -0.22*** (0.05) | 0.07 (0.05) | -0.28*** (0.10) | 0.34*** (0.10) |
| 52.5 – 55.0 | | -0.08 (0.05) | 0.00 (0.05) | 0.19* (0.11) | -0.83*** (0.11) |
| 55.0 – 57.5 | | 0.09 (0.06) | -0.27*** (0.07) | | |
| 57.5 – 60.0 | | 0.63*** (0.14) | -1.32*** (0.11) | | |
| Obs | | [806,955] | [785,535] | [378,552] | [362,702] |
| Workers | | 128,881 | 130,883 | 66,319 | 63,900 |

^a Mean Displacement probabilities in treatment cohort.

^b Simple DD is calculated including only seasonal dummies.

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% level.

Table 3: DD Estimates of Different Exit Categories: Multinomial Logit Model

| | Simple DD | | | DD ^a | | |
|-------|---------------------------|---------------------|----------------------|---------------------------|---------------------|----------------------|
| | Pensions | Other Quits | Layoff | Pensions | Other Quits | Layoff |
| Women | | | | | | |
| 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 | | |
| Men | | | | | | |
| 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 | | |

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

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

Table 4: DD Estimates at the Firm Level

| Types of workers | 1996 | | 2000 | |
|----------------------|----------------------|---------------------|----------------------|------------------------|
| | Non-Eligible | All | Non-Eligible | All |
| Layoffs ^a | 0.0385 | 0.0703 | 0.0347 | 0.0634 |
| DD ^b | -0.0011 (0.00068) | 0.0007 (0.00062) | 0.0013* (0.00067) | -0.0013** (0.00063) |
| Obs | [238,150] | [312,098] | [233,110] | [302,720] |
| Firms | 40,833 | 49,407 | 41,106 | 49,252 |
| χ^2 | 3207.60 | 4151.46 | 3104.73 | 4340.88 |

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

^b Marginal effect of layoff tax on firm-specific layoff rates. Control group are firms without workers eligible for the tax.

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), firmsize dummies(15) and dummies for sectors(7). *, **, *** indicate significance at the 10%, 5% and 1% level.