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**Minimum wages
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Evidence from
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Tiivistelmä

Tutkimuksessa tarkastellaan työehtosopimuksissa määräytyvien alimpien taulukko-palkkojen vaikutuksia palkkajakaumaan ja työllisyyteen vähittäiskaupan alalla. Aineistona käytetään EK:n yksityisten palvelualojen palkka-aineistoa vuosilta 1990-2005. Tähän aineistoon on liitetty työehtosopimukseen perustuvat kaupan alan vähimmäispalkat. Tutkimuksessa käytetään hyväksi erityisesti niitä poikkeuksia, joita vähimmäispalkkoihin sovittiin työmarkkinaosapuolten kesken 1990-luvun puolivälissä. Vuosina 1993-1995 oli mahdollista maksaa työehtosopimuksessa sovittua taulukkopalkkaa matalampaa palkkaa alle 25-vuotiaille nuorille. Tulosten perusteella nuoria koskevilla poikkeuksilla ei ollut vaikutuksia työllisyyteen, vaikka niillä olikin jonkin verran vaikutuksia todellisuudessa maksettuihin palkkoihin erityisesti palkkajakau-
man alapäässä.

Abstract

Following an agreement between the trade unions and the employer organisations, Finnish employers could pay less than the existing minimum wage for young workers between 1993 and 1995. We examine the effects of these minimum wage exceptions by comparing the changes in wages and employment of the groups whose minimum wages were reduced with simultaneous changes among slightly older workers for whom the minimum wage regulation was still binding. Our analysis is based on the payroll record data and minimum wage agreements from the retail trade sector over the period 1990-2005. We discover that average wages in the eligible group declined only modestly despite the fact that the excess supply of labour during high unemployment should make it relatively easy to attract workers even with low wages. The minimum wage exceptions had no positive effects on employment.

JEL Codes: J31, J51

This paper contains 6764 words.

1. Introduction

The negative employment effects of minimum wages were taken granted for decades (e.g. Stigler 1946; Brown *et al.* 1982). Only in the 1990s was this consensus view challenged. In their influential book Card and Krueger (1995) argued that the existing evidence of the minimum wage effects was questionable. They showed that minimum wage increases often had no negative employment effects and sometimes the effects were positive. Considerable debate about the relevance of the new view remains, however (Neumark and Wascher 2006). The effects of minimum wages on youth employment are subject to a similar controversy. Some studies find large negative employment effects due to the increases in minimum wages (e.g. Abowd *et al.* 2000; Pereira 2003), while other studies report considerable positive effects (e.g. Portugal and Cardoso 2006; Hyslop and Stillman 2007).

This paper evaluates the effects of minimum wages on youth wages and employment in Finland. The empirical analysis is based on a union agreement that allowed employers to pay less than the minimum wage to workers who were below 25 years of age and had at most one year's work experience. Hence, in contrast to many recent studies that have considered the effects of increases in minimum wages the Finnish policy involved a temporary decrease in the minimum wage. This subminimum youth wage policy was effective between 1993 and 1995 at the time of severe recession in the Finnish economy. The policy intended to boost employment among the groups that were most likely to be affected by high minimum wages. In this paper, we analyse the effects of the policy by comparing the changes in wages and employment of the group whose minimum wages were reduced with simultaneous changes among slightly older workers for whom the minimum wage regulation was still binding.

We focus on the retail trade sector, because it is a low-wage industry, where one could expect to discover negative employment effects stemming from minimum wages. Moreover, the turnover of the workforce is high and part-time work is very common, which could help firms to achieve desired changes in employment quickly (Brown 1999).

Finland does not have statutory minimum wage laws. Instead, minimum wages are determined in the contracts between the unions and the employer organisations.¹

These contracts are extended to all workers in the sector and are therefore also binding for non-union workers. Owing to the extension of union-bargained minimum wages to all workers the employment effects of the minimum wage contracts could be quite similar to the effects of statutory minimum wage laws. An interesting difference is that the union contracts do not specify a single minimum wage but a set of task-specific minimum wages. The minimum provisions vary across regions and the contracts contain clauses on how minimum wages depend on seniority. In this sense, the Finnish minimum wage system closely resembles the Swedish and Norwegian systems (Askildsen et al. 2000; Skedinger 2006). Union bargaining over minimum wages is not uncommon elsewhere either. For example, those seven EU countries that do not have statutory minimum wages have all established a tradition of minimum wages set by collective bargaining, often at the sectoral level. Even in countries with statutory minimum wages the social partners may have a direct or a consultative role in minimum wage adjustments (Eurofound 2007).

The evidence on the effects of union-negotiated minimum wages is sparse. Only one out of 86 studies that are cited by Neumark and Wascher (2006) considers the effects in the system with negotiated minimum wages. Skedinger (2007) argues that the union-bargained minimum wage system is interesting, because the negative effects of minimum wages can be larger or smaller, compared with the countries with statutory minimum wage legislation, depending on how well the unions are able to assess what a relevant market-clearing wage for unskilled workers is. The variation in the minimum wage across workers and the changes in the minimum wage that affect only some workers also help in studying the effects of the minimum wages. Skedinger (2006) uses this strategy and finds that the increases in the minimum wages have had significant negative effects on employment in Sweden.²

Our analysis is based on the payroll record data and minimum wage agreements for the period 1990-2005. To preview the results, we show that the minimum wages fundamentally shape wage distribution in the Finnish retail trade sector. There is a clear spike in wage distribution at the minimum rate and missing mass below that point. Still, we find that relaxing the minimum wage regulation for young workers had only a minimal impact on the actual wages. We find no positive employment effects.

The paper proceeds as follows. Section 2 describes the institutions and the structure of negotiated minimum wages. Section 3 explains the minimum wage exceptions for young workers during 1993-1995. Section 4 introduces the data. Section 5 contains our analyses. Section 6 concludes.

2. Finnish labour relations and minimum wages

Description of Institutions

Wage bargaining in Finland involves a high degree of co-ordination between the different unions and the employer organisations. A framework agreement is typically negotiated centrally between the union and employer federations on a one- or two-year basis. After central agreement has been reached, the individual unions and the respective employer organisations bargain over wages separately in each industry. These contracts determine a general wage increase applied to all wages and a wage schedule determining a minimum pay in each task. The industry-specific collective labour agreements are also binding for the non-union members in the industries where the union contract is “representative”. This is assessed by a specific institution, the Board for Ratification of the Validity of Collective Agreements and the Labour Court. They have considered a contract to be representative when at least half of the workers in the industry are union members. Since union density is about 70 per cent, most industries have a representative contract. Consequently, the coverage of collective agreements is around 95% of all workers, one of the highest rates among the OECD countries (Layard and Nickell 1999).

In the retail trade sector union density has declined rapidly but it was still about 55 per cent in 2000 (Böckerman and Uusitalo 2006: 292). Minimum wages in the retail trade are based on collective agreements between the Service Union United (PAM) and the Federation of Finnish Commerce (formerly the Commercial Employers’ Association). These minimum wages determine the lowest possible wage for each task in the retail trade sector. Employers can naturally pay more than the minimum, and the average wages are generally higher than the minimum rates. It is also possible that local agreement in a firm leads to lower wage increases than the national union contract. Under the current law, local agreements on wage increases are legally binding only if

their terms exceed the minimum terms in national contracts. Consequently, the minimum conditions cannot be repealed by the conduct of local negotiations.

The Structure of Minimum Wages in the Retail Trade Sector

In the retail trade sector task-specific minimum wages vary by region, the job-complexity level and the worker's experience. The collective agreements specify wages separately in three geographical regions. The aim is to compensate for the regional differences in the cost of living. Minimum wages are highest in the Helsinki metropolitan area (cost-of-living index region I) and lower in the cost-of-living index regions II and III. The cost of living classification used in the contracts is mainly based on the 1980 price-level estimates by Statistics Finland. These estimates attempted to capture regional differences in commodity prices and housing costs (Lehtonen et al. 1983). Even though these price-level estimates are obviously out of date, the classification has proved to be hard to change. In fact, some municipalities are still classified into a higher cost-of-living category based on even older data from the cost of living study done in 1974 (Lind et al. 1975).

In addition to regional variation, minimum wages depend on the job-complexity level and experience. In retail trade contracts there are six different job-complexity levels and four different experience levels (1st, 3rd, 5th and 8th year seniority increment) that determine minimum wages. These seniority increments are based on work experience in the retail trade sector, not only on tenure in the current firm. In this respect, the system in the Finnish retail sector is exactly the same as the one in Swedish hotels and restaurants described by Skedinger (2006).

To illustrate the minimum wage structure in the retail trade sector, Figure 1 displays the minimum wages in terms of regions and the worker's experience in 2000. The structure is largely similar in other years.³ In addition to the variation shown in Figure 1, there are separate minimum wages for trainees that are 85% of the lowest rate in each region. All these aspects are taken into account when we analyse the effects of minimum wages.

Figure 1 around here

Regarding the evolution of minimum wages over the period, it is important to note the Finnish economy went through a severe recession in the early 1990s. Output fell by 14% in the years 1990-1993. The unemployment rate increased to almost 20% from an average of around 5% during the 1980s. Consequently, there were substantial pressures to increase flexibility in wage formation. Moreover, a national bargain between the unions and employer organizations imposed a wage 'freeze' in the years 1992-1993 by extending the prevailing wage contracts.

3. Minimum wage exceptions

Because of macroeconomic difficulties, the right-wing government that was in power between 1991 and 1995 threatened to create new legislation to relax the minimum wage regulations for young workers. The aim of these plans was to improve employment opportunities for young workers during the times of high unemployment. To avoid legislative regulation and government involvement in wage bargaining the trade unions made an agreement with the employer organisations. Consequently, the minimum wages of young workers aged below 25 were temporarily reduced, based on a union agreement. There were minor differences in the exact content and the conditions of the exceptions between different sectors, because the agreements were negotiated separately for each industry. The agreement for the retail trade sector was signed on 7th June 1993. It was in force between 15th June 1993 and 15th June 1995.

Based on this agreement, the minimum wages of workers younger than 25 were reduced to 80 per cent of the lowest task- and region-specific tariffs during their first year in the retail trade sector. Furthermore, the trainee wage was reduced from 85 to 60 per cent of the lowest minimum wage prevailing in each region.

The only earlier attempt to evaluate the effects of the 1993-1995 minimum wage exemptions was a telephone interview for a sample of 150 employers by Saari (1996). His study covered all sectors, not only low-wage service sectors where the negative effects of minimum wages are most likely to appear. Saari (1996) discovered that only two out of 150 employers interviewed had taken advantage of the minimum wage exemptions (i.e. paid a lower actual wage than the one stipulated in the collective

agreement). Therefore, Saari (1996) concludes that the exceptions did not have any economically significant effect on employers' hiring decisions.

4. Data

Our data comes from the payroll records of the Finnish employers' association. The data covers all private service sector workers in firms that are members of the association. Hence, it covers around half of all workers in the retail trade sector. The data provides information about monthly wages, weekly working time, and some information about workers' individual characteristics such as age, gender and education. The data is detailed enough to identify all the factors that have an effect on the minimum wages for each person. This is quite natural, since one of the main purposes of collecting the data is to monitor wage growth after the union contract has been agreed upon. The data covers the situation during one month of each year (August before 1995 and October in and after 1995).

The monthly rate is defined as the 'personal wages paid for regular working time'. It includes such personal and 'task' specific bonuses (merit pay) that are paid at the same amount in each month. The monthly rate excludes performance-based payments, commissions, 'profit sharing' and similar payments. The monthly wage used is not simply a minimum wage based on contracted wage scales, but includes a significant person-specific component. The base wage excludes shift work, evening or Sunday bonuses that are paid at the same amount each month.

Half of the persons employed in the retail sector work as part-time workers (i.e. work regularly at most 34 hours per week). The average weekly working time is around 30 hours. Part-time work is much more common in the retail sector than in the labour market in general. According to the Labour Force Survey by Statistics Finland the share of part-time workers of all employees was 13% in 2005. Minimum wages are stipulated on a monthly basis in the collective labour agreements of the retail trade sector. For part-time workers, we construct a monthly wage by using the explicit formula that is stated in the collective agreements (full-time equivalent monthly wage = part-time worker's current wage * (37.5 / part-time worker's reported weekly working hours)).

We focus on two major occupational groups in the retail trade sector, which both consist of salespersons. Most of the workers (94%) in our data belong to the group of salespersons whose work does not require special professional expertise.⁴ A typical worker in the data is employed at the cash register in one of the retail business chains. Minimum wages are defined separately for these two groups in each year and they depend on region, the job-complexity level and the worker's experience, as explained earlier.

To avoid problems in defining the minimum rates for those that hold multiple jobs, we use information on the salespersons that have only one job (during the one-month interval of the data). These persons constitute around 99% of all available observations. The number of persons in the data each year varies according to the business cycle from around 30 000 to about 50 000. The total number of observations over the period is approximately 580 000. Minimum wages are collected from the collective agreements of the retail trade sector for each year and then linked to the payroll record data by using information on region, the job-complexity level and the worker's experience.

5. The effects of union-negotiated minimum wages

Shaping the Wage Distribution

The differences in percentages between actual nominal monthly wages paid by employers and the minimum monthly wages stipulated in the collective agreements for the years 1991⁵, 1995, 2000 and 2005 are shown in Figures 2-3 by using two different wage concepts. The figures clearly show the effects of the minimum wage. There is a clear cut-off in the wage distribution at the minimum rate and missing mass below that point.

Figures 2-3 around here

Two additional points are worth noting. First, most of the workers receive actual wages that are only slightly above the minimum wages that are stipulated in the collective agreements. The pattern is in line with the findings by Jones *et al.* (2006)

that note the same by using the data from a Finnish retail firm. Second, there is a small number of observations below the minimum rate. The share of subminimum wages depends on the exact wage concept used. Strictly speaking, the minimum wages refer to the base wage. The share of subminimum wages is larger when the base wage is used (the average share is about 10% for the period). Their share is around 5% when one is using the wage concept in which shift work, evening or Sunday bonuses that are paid at the same amount each month are added to the base wages. Some employers may confuse the base wage with the wage rate that contains bonuses.⁶ There is evidence that in many cases when subminimum wages are observed by using only the base wage, employers have assigned a large sum to the bonuses that are separately reported in the payroll record data. We therefore prefer the wage concept that includes shift work, evening and Sunday bonuses.

The remaining amount of subminimum wages is probably caused by the measurement error in regular weekly working hours. Moreover, it is possible that employers make mistakes when they classify their workers according to the job-complexity levels. The latter source seems to be less important, because the number of subminimum wages does not decrease much when the minimum wages are re-coded to the data without taking advantage of job-complexity levels (and workers' experience) and using information only on their regional variation. Measurement errors in working hours are important, because part-time work is very common. Overall, most subminimum wages are only marginally less than the minimum rate.

For comparison, Skedinger (2006: 271), using similar payroll record data for Swedish hotels and restaurants, reports that around one tenth of the observations have actual wages below the binding minimum wage. Consequently, the share of subminimum wages that we observe in the Finnish retail trade sector is of the same order of magnitude as the one reported by Skedinger (2006). As expected, both of these shares are significantly lower than the ones seen in household surveys that have often been used to examine the effects of minimum wages (e.g. Stewart and Swaffield 2002).

The 'Bite' of Minimum Wages and Regional Variation

Figure 4 shows that the minimum wages were somewhat more binding during the depression years in the early 1990s.⁷ The 'bite' of minimum wages tends to be weaker

for the youngest workers, because the minimum wages are lower for young workers that have less experience than older workers.⁸ This particular pattern is not necessarily common in the countries with statutory minimum wage legislation that specifies a single minimum rate. Moreover, the ratio of minimum wages to average wages for workers below age 25 declined drastically in 1993-1994 owing to the reduced minimum wages schemes during the years of exceptions.⁹ This also suggests that the cut in the minimum wage apparently did not substantially reduce average wages.

Figure 4 around here

It is interesting to study whether there appears additional regional variation in actual wages that is not directly related to the minimum wages, because unemployment is almost three times higher in some regions of Eastern and Northern Finland compared with the regions in Southern Finland (around the Helsinki metropolitan area). To shed light on this issue, we regress the logarithms of the minimum wages and the actual wages by using indicators for three separate cost-of-living index regions of the collective agreements as explanatory variables along with the control variables over the period 1990-2005.¹⁰ We find that regional variation in actual wages is larger than that in minimum wages. The level of actual wages and minimum wages is almost similar in the cost-of-living index region II, but in the Helsinki metropolitan area the actual wages are, on average, around 3% higher than the minimum rates, other things being equal. This shows that actual wages react to regional labour market conditions.

Outcomes of the Minimum Wage Exceptions

We study the effects of minimum wage exceptions by comparing the changes in wages and employment of the groups whose minimum wages were reduced to simultaneous changes among slightly older workers for whom the minimum wage regulation was still binding. We focus on the years 1991-1996, because the minimum wage exceptions were in force in our data in 1993-1994. When examining the wage effects, we restrict the data to workers below age 30 with a maximum of two years' work experience to obtain a control group that would be as close a substitute as possible to two treatment groups (workers below age 25 and trainees) that were eligible for minimum wage exceptions in 1993-1994.

Figure 5 depicts the kernel density estimates for the distribution of actual nominal wages for 1992-1993 and 1994-1995. First, in the top left-hand panel, we show the wage distribution for workers below age 25 in 1992-1993. There was a small increase in the mass at the lower tail of the distribution in 1993, which suggests that minimum wage exceptions did have effects on actual wages. To illustrate this, the share of wages that were under 800 (€) increased from 0.85% to 2.5% in 1992-1993. The top right-hand panel shows the distribution for the control group (workers aged 25-30 who had a maximum of two years' work experience) in 1992-1993. Overall, the changes were minimal in 1992-1993. Both top panels are consistent with the fact that there was a wage 'freeze' in 1992-1993. The lower panels in Figure 5 show the wage distributions for the treatment group and the control group in 1994-1995. The picture that emerges for the treatment group in 1994-1995 is not as clean as for the period 1992-1993, because there was a change in the interval of data collection in 1995 and the overall increase in wages in 1994-1995. For these reasons, the estimates regarding the decrease in the minimum wage in 1993 might be more reliable than the estimates regarding the increase in 1995.

Figure 5 around here

To quantify the effects of the minimum wage exceptions on actual wages and to assess their statistical significance, we report the levels and changes in wages among the treatment and the control groups in Table 1. The first nine cells on the top left corner report the average logarithm of wages in the period before (1991-1992), during (1993-1994) and after (1995-1996) the minimum wage exceptions. In the top right corner we report the changes in wages when minimum wage exceptions were introduced in 1993 and the changes in wages when these exceptions were removed in 1995. We calculate these changes separately in two treatment groups (workers below age 25 and trainees) and in the control group. In the bottom right corner we report the differences in these changes. These difference-in-differences estimates capture the effect of the minimum wage exceptions on actual average wages.

Table 1 around here

According to our estimates the decrease in the minimum wage decreased the average wages among the young workers by 1 per cent compared to the older control group.

Similarly the removal of the minimum wage exceptions increased wages also by 1 per cent compared with the control group. Because the sample size is large, even these small effects are statistically significant. The effect is larger for trainees. The trainee wage decreased by seven per cent more than the control group wage after the introduction of minimum wage exceptions and increased by eight per cent after their removal. However, the absolute number of trainees is quite small, as shown in square brackets on the top left corner of Table 1. In the right-most column we report the differences in wages between the period before the minimum wage exceptions (1991-1992) and the period after their removal (1995-1996). These estimates can be regarded as a specification test for the model. Significantly different changes over this period would imply that there have been different trends in the treatment and the control groups. Our estimates in the last column are very close to zero which validates the estimates for wage changes in the two previous columns.

To check the robustness of the findings, we have incorporated covariates (gender, education, industry, and region) into the models. Furthermore, we have estimated the models separately for the new recruits, which consist of those that move to the retail trade sector from outside the sector. The share of new recruits of all workers is high, because the labour market is fluid in this sector. These specifications change our baseline results only marginally. The main difference is that the estimated standard errors are larger, especially in the models for the new recruits. Moreover, it is possible that the average estimates obtained by OLS conceal more significant effects in some parts of the wage distribution. For this reason, we have estimated the wage models by using quantile regression methods. We estimated similar difference-in-difference models explaining logarithm of wages by group dummies, year dummies and their interaction capturing the lower minimum wage for the youngest workers in 1993 and 1994. We also included the covariates mentioned above. According to these results the minimum wage exceptions clearly had the largest effect on actual wages in the lowest wage quantile. This finding is consistent with Figure 5, according to which there was a small increase in the mass at the lower tail of the wage distribution in 1993.

To examine the potential employment effects of the minimum wage exceptions we aggregate the data to the firm level. Now we do not restrict the data to workers below

aged 30, but calculate the employment shares and the shares of hours worked by the treatment groups and the control group. Another difference to the wage regressions is that we weight our firm-level observations by the firm size. Otherwise, our difference-in-differences estimates for employment effects are similar to earlier estimates for wage changes.

In lower right corners of Table 2 we report weighted least squares estimates where we explain the employment share of the treatment and the control groups in the firm with time and group dummies and their interaction. The estimates in column titled “During – Before” are based on comparison of employment changes between the treatment and the control group when the minimum wages were reduced in 1993. Similarly the estimates in column titled “After – During” are based on employment changes that occurred when the minimum wage exceptions were removed in 1995 i.e. on an increase in the minimum wage among the youngest workers. Either of these estimates could be interpreted as an effect of minimum wage change and the setup can be compared to the earlier studies based on minimum wage changes affecting some particular group (e.g. Card and Krueger 1995; Portugal and Cardoso 2006; Hyslop and Stillman 2007).

Table 2 around here

Our estimates in column “During – Before” reveal that minimum wage cut seems to imply a decrease in employment in the affected groups. This result does not depend on whether we examine employment shares or the shares of hours worked nor on whether we examine workers below age 25 or trainees. These estimates are consistent with the positive employment effects of minimum wages rising, for example, from a monopsony model, as first argued by Card and Krueger (1995).

However, the estimates reported in column “After – During” reveal that employment decreased also when the minimum wage exceptions were removed i.e. when minimum wages increased. Employment in the groups affected by the minimum wage increase decreased by 1.6 – 4.5 percentage points more than in the control group depending on whether we examine the shares of employed or hours worked and depending on which treatment group we examine. Given that wage changes reported

in Table 1 were relatively small this implies that increasing minimum wages has substantial adverse effects on employment.

The contradictory findings are explained by the estimates in the right-most column where we compare the years 1991-1992 to the years 1995-1996. Apparently there has been a clear trend decreasing the employment of both treatment groups occurring simultaneously with the minimum wage changes. However, such trends are hard to detect with only one before-after comparison and short samples used in some earlier studies e.g. Card and Krueger (1995).

We have performed several robustness checks and tried to take into account the different trends in employment in different groups. To save space, we report only the difference-in-difference estimates for the shares of hours worked (Table 3). Because the number of firms changed over the period 1991-1996 we have estimated the models separately for the firms that exist for the whole period 1991-1996. We have also estimated separate models for the new recruits trying to account for the effects of the decline in hiring rates during the depression years (e.g. Ilmakunnas and Maliranta 2003). The results remain the same in these specifications.

Table 3 around here

Furthermore, we have estimated several different models for more restricted groups of new recruits by age. We report one specification in Table 3 in which we compare new recruits aged 24 with those new recruits aged 26. This is the only specification that passes our specification test and reveals no simultaneous group-specific trends. These estimates point to positive employment effects following the cut in minimum wages and to negative employment effects following a minimum wage increase. However, the quantitative magnitude of the estimates is small, and they are not statistically significant.

The literature often argues that the effects of minimum wages are largest for teenagers (Neumark and Wascher 2004; 2006). For this reason, we have checked whether there are any positive effects among the very youngest workers (those with age less than 20) that would be hidden in the aggregate numbers. The results do not change compared with the baseline model.

In addition to the models shown in Table 3, we have incorporated group-specific linear trends into the models. The results vary somewhat depending on the exact specification of the model, but the overall picture is that it is very hard to detect positive employment effects.

6. Conclusions

Following an agreement between the trade unions and the employers' organisations, Finnish employers could pay less than the existing minimum wage for young workers for two years between 1993 and 1995. We examine the effects of these minimum wage exceptions by comparing the changes in wages and employment of the groups whose minimum wages were reduced with simultaneous changes among slightly older workers for whom the minimum wage regulation was still binding. We discover that average wages in the eligible group declined only modestly. We could not detect any positive effects on employment.

At first sight, the findings for the minimum wage exceptions are somewhat surprising, given the prevailing macroeconomic situation. Excess supply of labour should have made it relatively easy to attract workers even with low wages. According to the LFS by Statistics Finland, the unemployment rate was 31% for workers aged 20-24 in 1994. One explanation is that even in times of high unemployment employers were not willing to pay less than the old minimum, fearing that paying less than a fair wage would have adverse effects on effort. Experimental evidence supports this reasoning (Falk *et al.* 2006). Furthermore, the Finnish findings are consistent with Katz and Krueger (1992), who noted the low utilization of subminimum wages in a situation where employers could have paid less than the minimum rate. In particular, it may be difficult for firms to justify the payment of different wages for the same work for workers with different ages. Then a temporary reduction in minimum wages for the youngest workers does not cause significant changes in actual wages. This does not rule out the possibility that the reduction of minimum wages across the board or a more permanent reduction in minimum wages would not have any effects.

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TABLE 1. Difference-in-differences' estimates of changes in wages

	Before (1991-1992)	During (1993-1994)	After (1995-1996)	Change (During – Before)	Change (After – During)	Change (After – Before)
Average logarithm of wage						
25 ≤ Age ≤ 30	6.992 (0.003) [3,120]	6.997 (0.003) [3,305]	7.128 (0.003) [3,616]	0.005 (0.004)	0.131 (0.004)	0.136 (0.004)
Age < 25	6.994 (0.002) [11,237]	6.988 (0.002) [8,885]	7.130 (0.002) [8,394]	-0.006 (0.003)	0.142 (0.003)	0.136 (0.003)
Trainees	6.967 (0.009) [389]	6.901 (0.011) [292]	7.111 (0.007) [623]	-0.066 (0.017)	0.210 (0.016)	0.144 (0.015)
Difference (Age < 25) – (25 ≤ Age ≤ 30)	0.002 (0.004)	-0.008 (0.004)	0.002 (0.004)	-0.010 (0.005)	0.011 (0.005)	0.000 (0.005)
Difference (Trainees) – (25 ≤ Age ≤ 30)	-0.025 (0.010)	-0.096 (0.010)	-0.016 (0.008)	-0.071 (0.014)	0.079 (0.014)	0.009 (0.013)

Note: The wage concept is the logarithm of actual nominal wage that consists of base wage added to shift work, evening or Sunday bonuses that are paid at the same amount each month. Estimated standard errors in parentheses; number of observations in square brackets. The numbers in the shadowed area are the difference-in-differences' estimates.

TABLE 2. Difference-in-differences' estimates of changes in employment and hours worked

	Before (1991-1992)	During (1993-1994)	After (1995-1996)	Change (During – Before)	Change (After – During)	Change (After – Before)
Employment share						
25 ≤ Age ≤ 30	0.133 (0.002)	0.162 (0.002)	0.182 (0.002)	0.029 (0.003)	0.020 (0.003)	0.049 (0.003)
Age < 25	0.195 (0.002)	0.190 (0.003)	0.183 (0.003)	-0.006 (0.003)	-0.007 (0.004)	-0.013 (0.003)
Trainees	0.055 (0.001)	0.030 (0.001)	0.033 (0.001)	-0.025 (0.002)	0.005 (0.002)	-0.022 (0.002)
Difference (Age < 25) – (25 ≤ Age ≤ 30)	0.062 (0.004)	0.028 (0.003)	0.001 (0.003)	-0.035 (0.004)	-0.027 (0.005)	-0.062 (0.004)
Difference (Trainees) – (25 ≤ Age ≤ 30)	-0.078 (0.002)	-0.132 (0.002)	-0.149 (0.002)	-0.054 (0.003)	-0.016 (0.003)	-0.071 (0.003)
Share of hours worked						
25 ≤ Age ≤ 30	0.134 (0.002)	0.162 (0.002)	0.186 (0.002)	0.028 (0.003)	0.023 (0.003)	0.051 (0.003)
Age < 25	0.178 (0.002)	0.169 (0.002)	0.147 (0.002)	-0.009 (0.003)	-0.022 (0.003)	-0.031 (0.003)
Trainees	0.040 (0.001)	0.022 (0.001)	0.019 (0.001)	-0.018 (0.001)	-0.003 (0.001)	-0.021 (0.001)
Difference (Age < 25) – (25 ≤ Age ≤ 30)	0.044 (0.004)	0.007 (0.003)	-0.038 (0.003)	-0.037 (0.004)	-0.045 (0.005)	-0.082 (0.004)
Difference (Trainees) – (25 ≤ Age ≤ 30)	-0.094 (0.002)	-0.140 (0.002)	-0.167 (0.002)	-0.046 (0.003)	-0.026 (0.003)	-0.072 (0.003)
Number of firms	6 524	5 510	4 670			

Note: Estimated standard errors in parentheses. The numbers in the shadowed area are the difference-in-differences' estimates.

TABLE 3. Difference-in-differences' estimates of changes in hours worked; additional specifications

	Change (During – Before)	Change (After – During)	Change (After – Before)
Continuing firms 1991-1996			
Difference (Age<25) – (25≤ Age ≤ 30)	-0.032 (0.006)	-0.046 (0.006)	-0.078 (0.006)
Difference (Trainees) – (25≤ Age ≤ 30)	-0.041 (0.004)	-0.026 (0.004)	-0.067 (0.004)
New recruits			
Difference (Age<25) – (25≤ Age ≤ 30)	-0.040 (0.009)	-0.066 (0.010)	-0.106 (0.008)
Difference (Trainees) – (25≤ Age ≤ 30)	-0.084 (0.007)	-0.042 (0.007)	-0.127 (0.007)
New recruits aged 24 vs. new recruits aged 26			
Difference (Age 24 – Age 26)	0.004 (0.003)	-0.003 (0.004)	0.001 (0.004)
Age below 20			
Difference (Age<20) – (25≤ Age ≤ 30)	-0.039 (0.003)	-0.026 (0.003)	-0.065 (0.003)

Note: Estimated standard errors in parentheses. The numbers in the shadowed area are the difference-in-differences' estimates.

FIGURE 1. The level of minimum wages (€) in terms of regions and worker's experience measured in years (1-2, 3-4, 5-7, and 8-) for the salespersons whose work does not require special professional expertise, for the year 2000.

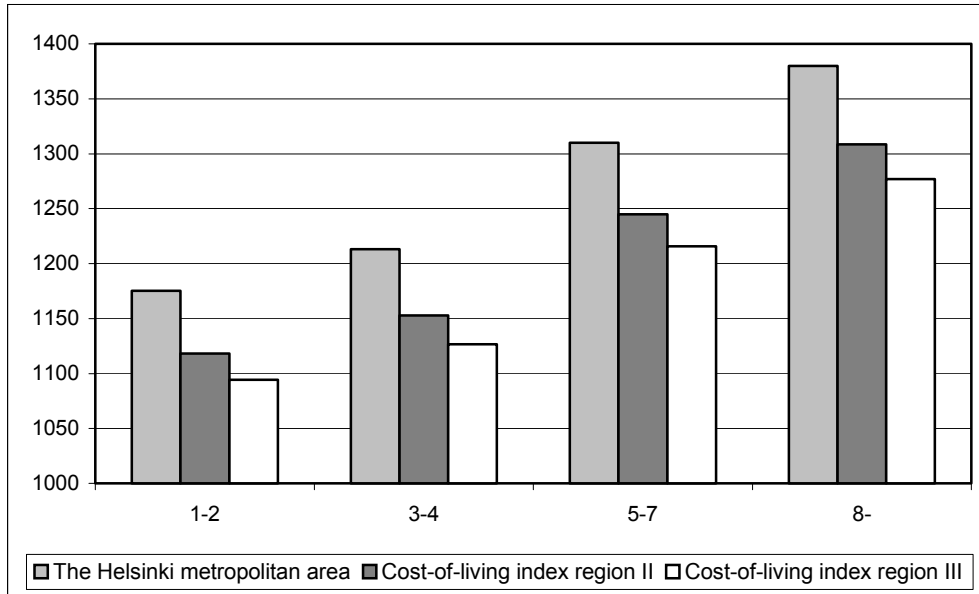
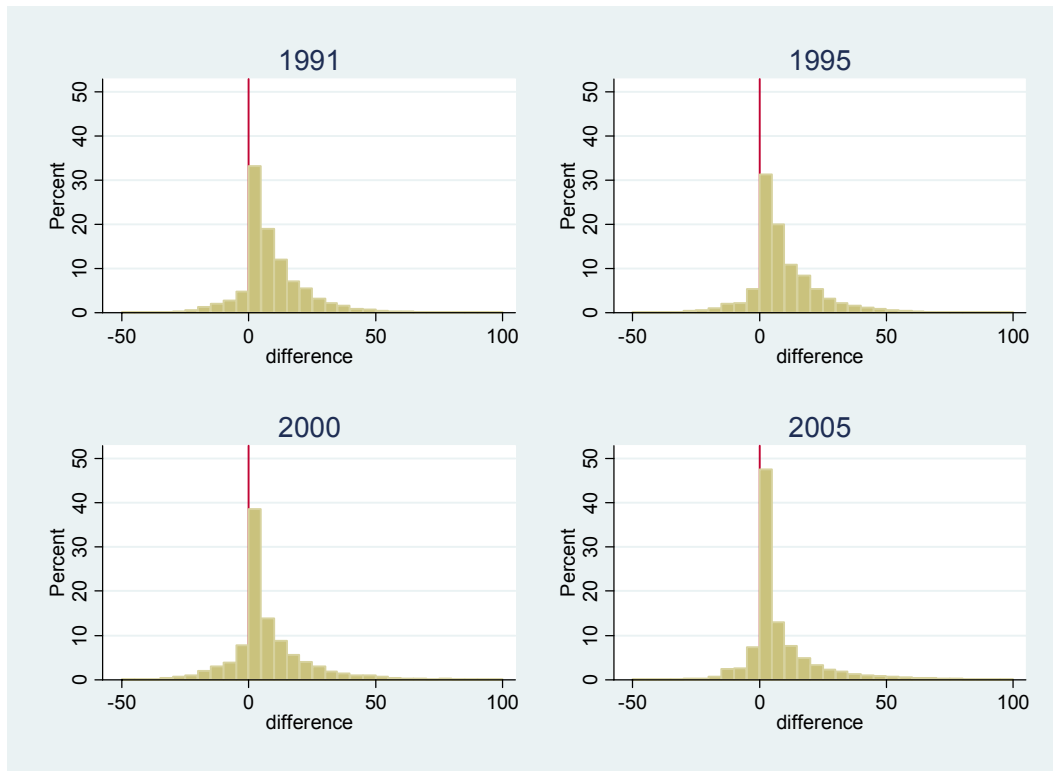
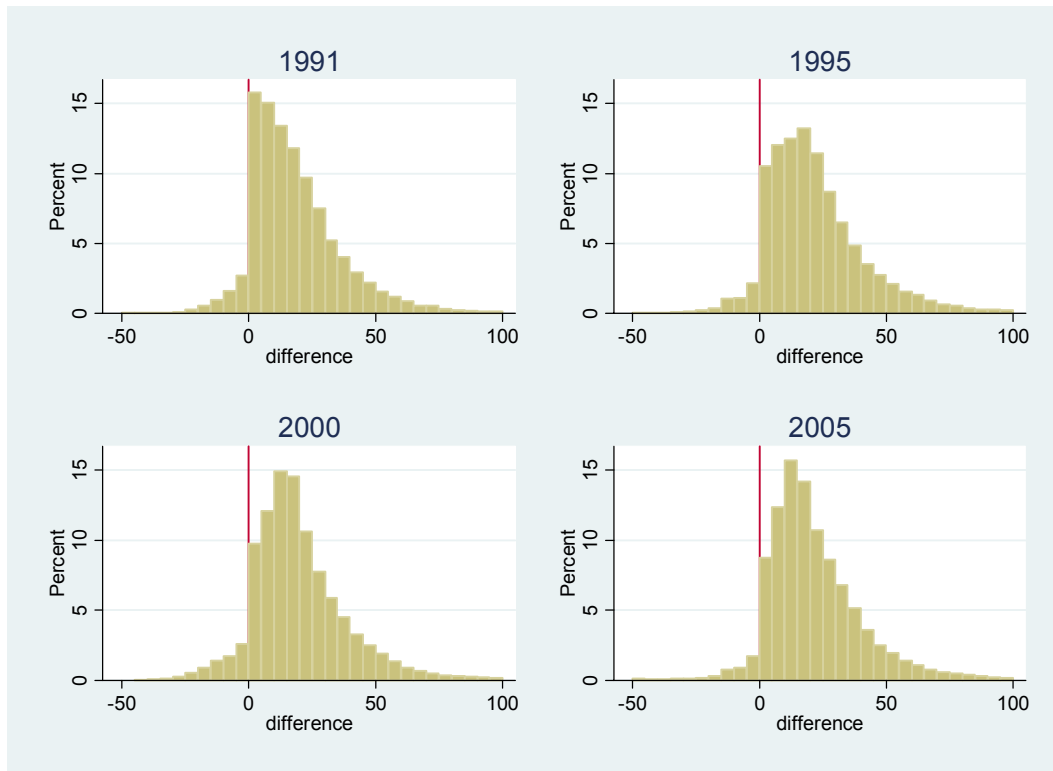


FIGURE 2. The differences (%) between actual wages and task-specific minimum wages.



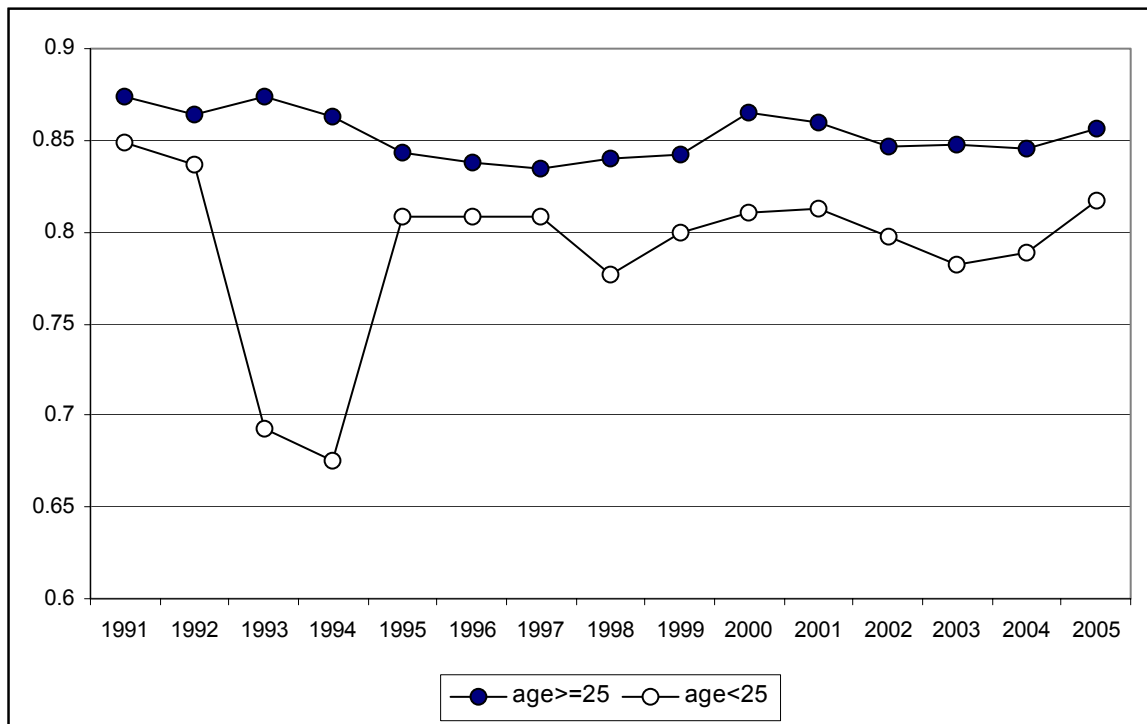
Note: The wage concept consists of the base wage only. The vertical line is at zero.

FIGURE 3. The differences (%) between actual wages and task-specific minimum wages.



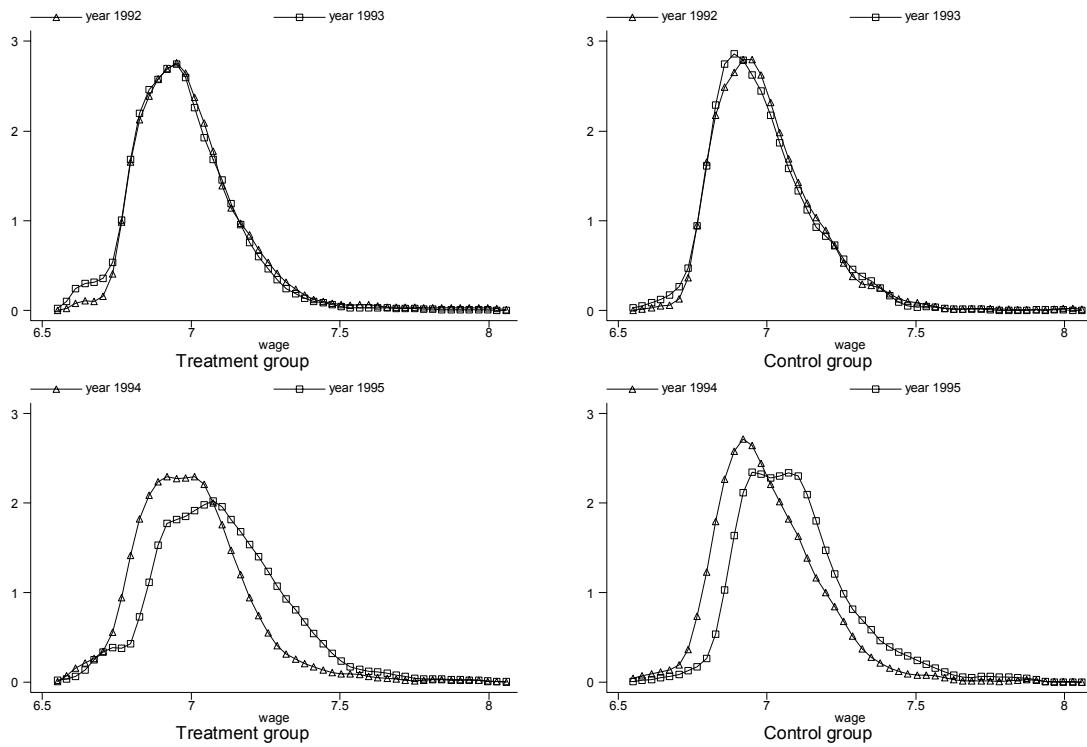
Note: The wage concept consists of the base wage added to shift work, evening or Sunday bonuses that are paid at the same amount each month. The vertical line is at zero.

FIGURE 4. The ratio of minimum wages to average wages.



Note: The wage concept consists of the base wage added to shift work, evening or Sunday bonuses that are paid at the same amount each month.

FIGURE 5. The wage distributions for the treatment group and the control group.



Note: The wage concept is the logarithm of the actual nominal wage that consists of the base wage added to shift work, evening or Sunday bonuses that are paid at the same amount each month. The treatment group consists of workers below age 25 and the control group consists of workers aged 25-30 with a maximum of two years' work experience. We have dropped 0.5% of the lowest and highest values.

¹ There have been minimum wages in Finland as long as there have been collective agreements. The printers' union negotiated the first collective agreements in the early 20th century. Collective agreements were not unusual before January 1940, when the employers formally recognized the unions for the first time (Bergholm 2005: 22-23). These contracts were not binding on non-members, however.

² There is almost no evidence of the effects of minimum wages in Finland. The only existing study (Sauramo and Solttila 1985) uses time-series data on youth employment shares and the ratio of minimum and average wages at the industry level. It finds no negative effects on youth employment.

³ There have been some minor changes in the details of the system. There was an 11th year seniority increment in the years 1991-1999 that has not been applied in other years. Moreover, in the year 1990 (the first year of our data) the classification of seniority increment was different from the rest of the years (including 1st, 4th, 6th and 8th year seniority increment).

⁴ The results that are reported for the effects of minimum wage exceptions remain the same if we drop the group of salespersons whose work requires special professional expertise from the data, because very few young workers belong to this particular group.

⁵ We use data from 1991 instead of 1990 because the wage increases agreed in the 1990 contract raised the minimum wages from October 1st 1990. The year 1990 was also the first year when the payroll record data was gathered. Therefore, the data from 1990 may contain more errors.

⁶ Our discussions with the Finnish employers' association support this conclusion.

⁷ Previously, it has been estimated for all sectors that the ratio of minimum rates to average wages is moderate in Finland, i.e. 0.52 (Layard and Nickell 1999: 3043). The estimate is not based on micro-level sources that would take into account all the relevant aspects in the determination of union-negotiated minimum wages, however.

⁸ We do not present separate ratios for trainees, because their number was rather small during the period 1993-1994. This is shown later in Table 1.

⁹ We do not include the year 1995 in the years of minimum wage exceptions, because the exceptions ended on June 15th 1995 and the payroll record data for the year 1995 was gathered from the firms in October.

¹⁰ The estimation results are available upon request. The industry classification that is available in the payroll record data refers to different retail trade chains. It does not correspond to the official industry classification that is used by Statistics Finland.