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Footnotes

For further information on employee absenteeism, contact Joseph R. Meisenheimer II at (202) 523-1944.

¹ Because of the conceptual difficulties with measuring the cost to the U. S. economy of employee absences, no broad-based measure has been developed. Some studies, however, have attempted to measure the costs of absences in individual firms. One such study, which focused on tellers in a midwestern bank, was Philip H. Mirvis and Edward E. Lawler III, "Measuring the Financial Impact of Employee Attitudes," *Journal of Applied Psychology*, 1977, vol. 62, pp. 1-8.

² The Current Population Survey, conducted monthly by the Bureau of the Census for the Bureau of Labor Statistics, is a sample survey of approximately 60,000 households. The CPS provides estimates for a broad variety of characteristics of the U.S. population and labor force. Absence data are obtained from questions asked each month on the actual number of hours worked during the survey reference week and the usual number of hours worked per week. The question on actual hours is asked of all employed persons in the CPS sample, while the question on usual weekly hours is normally asked of one-fourth of the CPS sample. In special CPS supplements collected in May of 1973-80, 1985, and 1989, the question on usual weekly hours was asked of the entire sample.

³ These data have long been available monthly, but have never been analyzed in the context of absences. An advantage of using annual average data is that the sample size for the question on usual weekly hours is three times larger than that of the May supplement. Thus, annual averages have better statistical reliability than do the May data. The difference in sample size can be shown with the following equation:

Sample size for the May supplement = S

Sample size in a normal month = $\frac{1}{4}(S)$

Sample size for the 12 months of 1989 = $12(\frac{1}{4}(S)) = 3(S)$

⁴ In past BLS reports on absences, the absence rate was referred to as the "incidence rate," and the lost worktime rate was referred to as the "inactivity rate."

⁵ In addition to the annual and quarterly averages, data for May 1989 were tabulated separately to examine whether absence behavior in May is typical of that throughout the year. As this tabulation shows, the May data differ sharply from the annual averages and also from the quarterly data for April to June. This indicates that the new tabulation procedure reflects absence behavior throughout the year more accurately than the former method.

⁶ Unmarried women include widowed, divorced, separated, and never-married women.

⁷ This may be explained by the ages of married men with and without children. Nearly a third of married men without children are 55 or older—an age group with a relatively high incidence of absences. By comparison, 94 percent of married fathers are in the central working ages (25 to 54), which have a relatively low incidence of absences.

⁸ Absence data by occupation of men and women separately are available from the author.

⁹ One possible explanation for the high lost worktime rate in mining may be unusual work schedules, rather than absences from work. In the oil and gas extraction industry, mining's largest component, offshore workers may work 80 or more hours in one week and no hours the following week. A worker with such a schedule could be tabulated in the CPS as working less than 35 hours due to "other" reasons, even though this worker did not actually have an absence. Overall, unusual work schedules affect relatively few workers, but in some industries, such as mining and transportation, and in some occupations, such as teaching, the nature of work schedules could have a substantial impact on CPS absence data. Thus, absence data for these industries and occupations should be viewed with caution.

Would a higher minimum wage help poor families headed by women?

Linda R. Martin and
Demetrios Giannaros

While the incidence of poverty in the United States has fallen from 22.2 percent in 1960 to 13.5 percent in 1987, a significant component of the decrease occurred in the 1960's. In fact, the poverty rate, the proportion of the population that fell below the Federally established poverty level, remained relatively stable during the decade of the 1970's, increased in the early 1980's, and then experienced a slight decrease again in the mid-1980's. More significantly, over the same period, the demographic composition of the poor has changed.

On one hand, poverty among the elderly declined from 25 percent of all elderly in 1969 to 12.4 percent in 1986. On the other hand, the poverty rates of blacks and of households maintained by women remained relatively constant, at 31 percent and 34.6 percent. However, the percentage of all households which are headed by women grew from 28.5 percent in 1969 to 37 percent in 1986, and the proportion of the poor residing in such households rose from 18 percent

in 1959 to approximately 38 percent in 1986.¹ The increase of the poor in these households, referred to as the feminization of poverty, has rekindled interest in and discussion on the causes and possible solutions to the problems of poverty.

Earlier studies of the feminization of poverty focused on the effect of government transfer payments on family structure. Labor market conditions have not been emphasized as possible dominant factors in explaining the upward trend in the poverty rate. The minimum wage rate set by the Federal Government influences both the national unemployment rate and the real level of income of low-income households and, thereby, affects the rate of poverty. The nominal minimum wage rate was \$3.35 per hour from 1981 until this year, resulting in a significant decrease in the real minimum wage as inflation increased.

Ralph Smith and Bruce Vavrichek suggested that low-wage workers who had no other earners in their families faced a 50-percent incidence of poverty.² Because women are overrepresented in the low-wage labor market, a relationship between the minimum wage and poverty in households headed by women may exist.³ Therefore, we hypothesize that not only the unemployment rate but also the real minimum wage would be a determinant of the rate of poverty.

A number of other studies on the determinants of overall poverty have suggested that economic growth is a primary factor in reducing poverty. In 1965, Lowell E. Galloway observed that decreasing real economic growth and increasing unemployment are the primary determinants of rising poverty rates.⁴ However, Henry Aaron argued that Galloway was overly optimistic.⁵ Using more disaggregated data, Aaron concluded that economic progress would not touch the hard-core poor and, therefore, government antipoverty programs would be needed. A 1978 study by James Thornton and others concluded that "economic growth no longer affects poverty irrespective of whether a relative or the absolute definition of poverty is used. Our findings indicate that the contribution of growth has been overstated."⁶ The authors suggested that income transfers and unemploy-

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ment play a role in determining the incidence of poverty, although their empirical results indicate that transfers are not statistically significant.

In a more recent study, we also observed that changes in real per capita government income transfers were not significant, but real per capita income and the rate of unemployment were most influential in explaining the variation in the poverty rate.⁷ Peter Gottschalk and Sheldon Danziger concluded that, in addition to economic growth, the degree of income distribution inequality and government transfers are the primary determinants of poverty.⁸ The increasing degree of income inequality and its effect on poverty can be attributed partly to the relative effects of unemployment. Rebecca M. Blank and Alan S. Blinder found that decreases in unemployment had a positive effect on all earnings but that increases in unemployment had greater effects on the earnings of low-income recipients.⁹ Edward M.

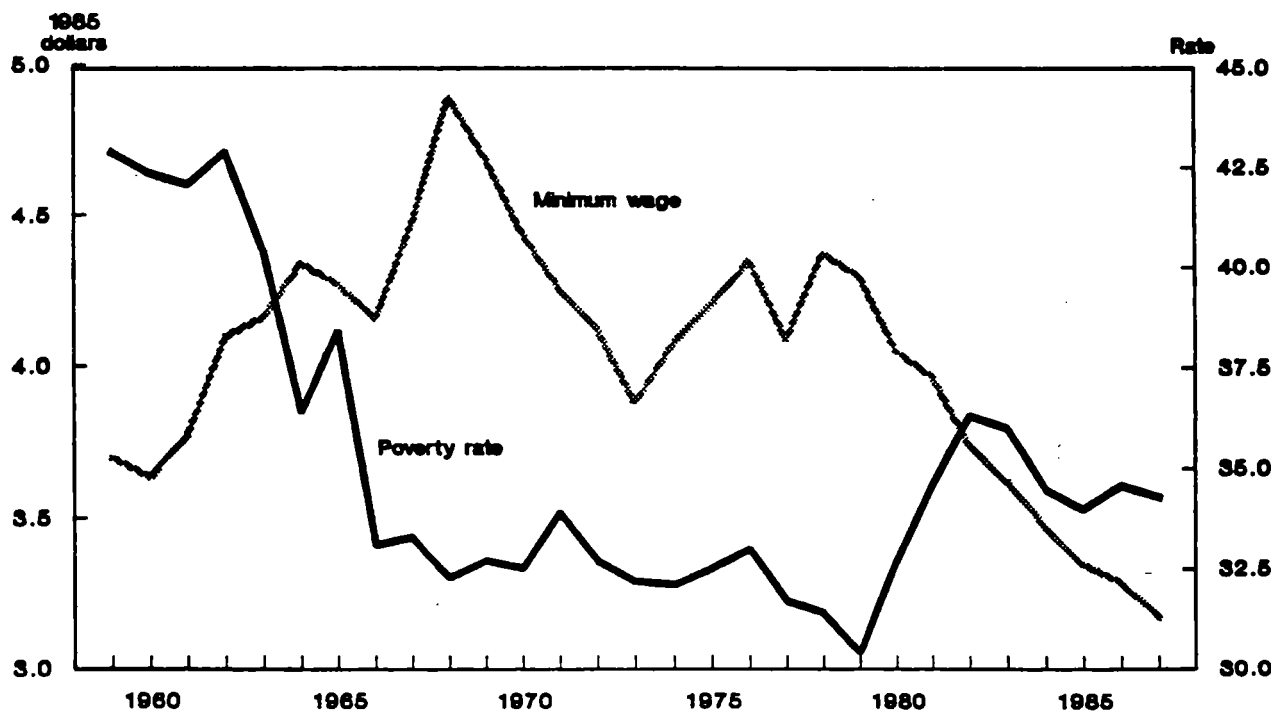
Gramlich and Deborah S. Lauren also observed a similar cyclical effect.¹⁰

Aaron first observed that the source of poverty among diverse population groups may differ. Julius W. Wilson and Kathryn M. Neckerman suggested that the high rate of unemployment of black males had led to the formation of households maintained by women and thus has contributed to women's high poverty rates.¹¹ Other studies on the feminization of poverty have focused on the effects of government transfer payments, rather than on economic growth and unemployment, hypothesizing that the availability and scope of these payments encouraged poverty among women. However, these studies have shown conflicting results. In a review of several articles, Isabel Sawhill indicated that, while government transfer payments have reduced poverty, the impact has been small.¹² Studies suggesting that transfer payments reduce work incentives and promote the formation of households headed by women assume that receipt of Aid to Families

with Dependent Children (AFDC) payments reduces the dependency of women on male wage earners. Other studies suggest various forces influencing formation of households. Empirical studies on the indirect effect of income transfers on family structure provide mixed results.¹³

While sociological and demographic changes may affect family structure, we propose that the real minimum wage has a pronounced effect on the poverty rate of households maintained by women, because the participation of these women in low-wage labor markets is relatively high. Chart 1 reveals that from 1959 to 1968 the real minimum wage increased, while poverty decreased dramatically. The real minimum wage declined after 1968, increased briefly between 1973 and 1978, and then continued to decrease. Note that the poverty rate rose from 1979 to 1982, while the real minimum wage fell. In fact, the real minimum wage level of 1987 was lower than that of 1960.

Chart 1. Poverty rate of households headed by women and the real minimum wage, 1959-87



SOURCES: *Money Income and Poverty Status of Families and Persons in the U.S.* (Bureau of the Census, various issues); and *Statistical Abstract of the United States* (Bureau of the Census, 1988).

Table 1. Estimated equation for the level of poverty in households headed by women (V), 1959-87

Equation	Constant	RMIN	UNF	RFMEDY	PCGNP	RFAFDC	TR	R ²	Durbin-Watson statistics	F-statistics
1	74.59 (3.93)*	-4.53 (.68)*	0.34 (.23)	-3.81 (.32)				0.88	1.81	58.53*
2	78.77 (4.65)*	-5.65 (.79)*	.31 (.26)		-1.67 (.16)*			.84	1.48	44.05*
3	74.55 (4.04)*	-4.62 (1.19)*	.36 (.28)	-3.82 (.33)*		.07 (.75)		.88	1.82	42.16*
4	82.62 (3.61)*	-2.29 (.96)*	-.13 (.22)		-1.72 (.12)*	-2.74 (.61)*		.91	1.95	63.11*
5	71.68 (4.95)*	-4.96 (.82)*	.58 (.34)**	-2.97 (.93)*			.01 (.01)	.88	1.93	44.03*
6	84.39 (17.60)*	-5.47 (.98)*	.02 (.92)		-2.20 (1.60)		.01 (.03)	.84	1.43	31.89*

*Significant at the 0.05 level.

**Significant at the 0.10 level.

NOTE: Variables are defined as follows:

V = Percent of households headed by women that fall below poverty level.

RMIN = Real minimum wage.

UNF = Unemployment rate for women.

RFMEDY = Real median income of women in thousands of dollars.

PCGNP = Real per capita GNP, in thousands of dollars.

RFAFDC = Real annual per family payment of AFDC, in thousands of dollars.

TR = Real government transfer payments in billions of dollars.

Values in parentheses are standard errors.

The primary objective of this study is to determine whether the real minimum wage, unemployment, economic growth, and transfer payments play a significant role in determining the rate of poverty of households headed by women. The second section describes the model and data, the third section discusses the empirical results, and the fourth presents the concluding remarks.

The model and data

To empirically examine the stated propositions regarding the determinants of poverty, a simple model is used. This model expresses the rate of poverty of households headed by women as a function of the real minimum wage rate, the rate of female unemployment, and economic growth as measured by either the real median income of women or real per capita gross national product.

The changes in the real minimum wage affect poverty in two ways. First, the earnings potential of working women is closely associated with the real minimum wage. Joan Smith ob-

served that industries most responsible for the growth in female employment pay a wage rate that requires the recipient to find additional resources to remain above the poverty level.¹⁴ Lauri Bassi noted that the number of hours of compensated work by women is positively associated with increasing poverty.¹⁵ The declining value of the real minimum wage seems to be one of the underlying reasons for working women's poverty. Secondly, when potential job earnings are low, the unemployed female head of household may continue to rely on government transfer payments, such as AFDC, even when these payments are decreasing.

Because Galloway and Thornton and others used different measures of real economic growth for their estimates, two measures are used here to determine the better performing model. While the real median income of women and real per capita GNP both reflect general economic conditions, one would expect the former to better represent the effect of changes in general economic conditions on women and their households.

One would also expect the real minimum wage and economic growth to be negatively related with the dependent variable. That is, as real earnings for individuals and real income in the economy as a whole increase, the poverty rate decreases. The sign of the coefficient of unemployment would be positive because increasing unemployment would increase the percentage of the population in poverty. The basic equation to be estimated is expressed as follows:

$$(1) V = a_0 + a_1 RMIN + a_2 UNF + a_3 RFMEDY + u_1$$

$$a_1, a_3 < 0, a_2 > 0$$

where V is the percentage of families in households maintained by women that fall below the Federally defined poverty line. RMIN is the real minimum wage, UNF is the female unemployment rate, RFMEDY is the real median income of women, and u is the random error term. The alternative basic equation to be estimated substitutes the real per capita GNP (PCGNP) for RFMEDY.

$$(2) V = b_0 + b_1 RMIN + b_2 UNF + b_3 PCGNP + u_2$$

$$b_1, b_3 < 0, b_2 > 0$$

We also introduce a measure of government transfer payments to determine whether these payments affect poverty in households headed by women, as suggested by Gottschalk and Danziger. Thus, we get the following alternative formulations:

$$(3) V = c_0 + c_1 RMIN + c_2 UNF + c_3 RFMEDY + c_4 RFAFDC + u_3$$

$$c_2, c_3, c_4 < 0, c_1 > 0$$

and

$$(4) V = d_0 + d_1 RMIN + d_2 UNF + d_3 PCGNP + d_4 RFAFDC + u_4$$

$$d_1, d_3, d_4 < 0, d_2 > 0$$

The variable RFAFDC is the real value of annual AFDC payments per family. AFDC payments can be considered representative of the transfer payments received by households headed by women. The real value of Federal and State transfer payments (TR) was

also used as an alternative measure of total transfer payments.

For the empirical estimations, we use annual data for the period of 1959–87. The parameters of the equations are estimated using the ordinary least squares technique. All monetary variables are measured in real terms with a base year of 1985. The Consumer Price Index for Urban Consumers was used to deflate all the variables with the exception of *PCGNP*. For *PCGNP*, the GNP implicit price deflator was used instead.

Empirical results

The empirical results of equations (1) to (6) in table 1 allow us to make some suggestions regarding the propositions tested. The summary statistics of all the estimated equations are at satisfactory levels. The most interesting result is that in all of the equations, regardless of the model structure applied, the real minimum wage (*RMIN*) is statistically significant and negatively related to the dependent variable. Therefore, the results satisfy the *a priori* expectations. The rate of poverty of households maintained by women seems to be significantly affected by changes in the real minimum wage. The magnitude of the impact is also important. For example, in equation (1), the estimated coefficient indicates that a \$1 increase in the real minimum wage would decrease poverty by approximately 4.5 percentage points. The statistical results imply, as one would expect, that low wages are a significant factor in determining poverty rates. If the real minimum wage had remained constant at its maximum 1968 value (\$4.90), poverty would have been reduced by 7.8 percentage points from its 1987 level of 34.3 percent. Alternatively, if the 1987 real minimum wage maintained the 1959–87 average value, the poverty rate would have declined by 3.9 points in 1987.

Some authors have suggested that changes in the rate of poverty are partly explained by the variation in the percentage rate of unemployment. Our estimations do not support this proposition. Overall, unemployment seems to be insignificant. This may be because the effect of unemployment is captured indirectly through the production/income variables.

The real median income of women (*RFMEDY*) is statistically significant in all equations. The real per capita GNP (*PCGNP*) is significant in 2 of 3 equations. These results substantiate findings in earlier studies by Galloway, Thornton and others, Gottschalk and Danziger, and ourselves. Although the statistical results are more consistent with *RFMEDY* as an independent variable, there appears to be no substantial improvement in the equation structure and explanatory power when the real median income of women is used (equations 1, 3, and 5, table 1) instead of real per capita GNP. The observed signs of the income coefficients are negative, satisfying our *a priori* expectations. The magnitude of the coefficients indicates that the real median income of women has a somewhat greater effect on poverty rates than real per capita GNP. A coefficient value of approximately –3.8 in equation (1) implies that for every \$1,000 increase in the real median income of women, poverty will decrease by 3.8 percentage points.

In equations 3 to 6 of table 1, real per-family payment of AFDC (*RFAFDC*) and, alternatively, real government transfer payments (*TR*) are introduced to test for their statistical significance. The empirical results, in general, do not conform with the theoretical suggestions of Thornton and others, and Gottschalk and Danziger that transfer payments significantly affect the poverty rate but support the conclusions we reached in our study of general poverty behavior. The results do substantiate Sawhill's report that the effect of government transfers on the feminization of poverty has been small. In 3 of 4 equations, the real transfer payments are statistically insignificant. The neutral impact of real transfer payments on poverty may indicate that these benefits affect family structure and the formation of households headed by women but may not have a direct effect on the level of poverty of these households.

Conclusion

A number of studies have been carried out to investigate the determinants of poverty. Some have suggested that economic growth is the vehicle to decrease the level of poverty; however, others

have suggested that government policy regarding income transfers and unemployment are also important factors in explaining the incidence of poverty. Research on the feminization of poverty indicates that the formation of households headed by women in itself was the cause of increased poverty in that segment of the population. We suggest that the real minimum wage set by the Federal Government is a determinant of the poverty rate in these households.

The overall results and analysis of the estimated poverty equations allow for the following observations regarding the propositions tested:

- The most important empirical conclusion of this study is that, in relative terms, the real minimum wage plays a major role in explaining the feminization of poverty.
- Changes in the real median income of women and real per capita income are statistically significant in determining changes in the poverty rate of households headed by women. That is, fluctuations in economic activity affect overall income and labor market conditions and, therefore, impact poverty rates.
- The rate of unemployment does not seem to directly affect the variation in the poverty rate of households maintained by women. This may be because economic activity variables may indirectly reflect the unemployment effects.
- Government transfer payments do not seem to play an important role in explaining poverty rate variations for this household cohort.

It should be noted that a number of studies suggest negative employment consequences as the minimum wage is increased. This may not affect poverty among households headed by women because the unemployment rate does not seem to play a statistically significant role in determining the poverty rate of this cohort. An increased real minimum wage might also encourage a higher rate of labor market participation and also automatically lift some working women who head households above the poverty line.

The conclusions reached here are suggestive and have major implications

regarding economic policy to fight poverty. More analysis is required before one reaches definitive conclusions. We hope that this study will stimulate further research and discussion on the determinants of poverty. □

Footnotes

¹ Victor R. Fuchs, *The Feminization of Poverty?* Working Paper, 1934 (Cambridge, MA, National Bureau of Economic Research, Inc., 1986).

² Ralph Smith and Bruce Vavrichuk, "The minimum wage: its relation to incomes and poverty," *Monthly Labor Review*, June 1987, pp. 24-30.

³ Richard V. Burkhauser and T. Aldrich Finegan, "The Minimum Wage and the Poor: The End of a Relationship," *Journal of Policy Analysis and Management*, 1989, vol. 8, no. 1, pp. 53-71.

⁴ Lowell E. Galloway, "The Foundations of the 'War on Poverty'," *The American Economic Review*, 1965, vol. 55, pp. 123-31.

⁵ Henry Aaron, "The Foundations of the 'War on Poverty' Reexamined," *The American Economic Review*, 1967, vol. 57, pp. 1229-40.

⁶ James Thornton, Richard Agnello, and Charles Link, "Poverty and Economic Growth: Trickle Down Peters Out," *Economic Inquiry*, 1978, vol. 16, no. 3, pp. 385-93.

⁷ Demetrios Giannaros, "Government Transfers, Growth and Unemployment Effects on Poverty: An Empirical Investigation," *Journal of Economics*, 1988, vol. XIV, pp. 84-91.

⁸ Peter Gottschalk and Sheldon Danziger, "A Framework for Evaluating the Effects of Economic Growth and Transfers on Poverty," *The American Economic Review*, 1985, vol. 75, pp. 153-61.

⁹ Rebecca M. Blank and Alan S. Blinder, "Macroeconomics, Income Distribution, and Poverty," in Sheldon H. Danziger and Daniel Weinberg, eds., *Fighting Poverty* (Cambridge, MA, Harvard University Press, 1986).

¹⁰ Edward M. Gramlich and Deborah S. Lauren, "How Widespread Are Income Losses in a Recession?" in D. Lee Bawden, ed., *The Social Contract Revisited* (Washington, Urban Institute Press, 1984).

¹¹ Julius W. Wilson and Kathryn M. Neckerman, "Poverty and Family Structure: The Widening Gap Between Evidence and Public Policy Issues," in Sheldon H. Danziger and Daniel Weinberg, eds., *Fighting Poverty* (Cambridge, MA, Harvard University Press, 1986).

¹² Isabel Sawhill, "Poverty in the U.S.: Why Is It So Persistent?" *Journal of Economic Literature*, 1988, vol. 26, no. 3, pp. 1073-1119.

¹³ For details, see Sheldon Danziger, George Jakubson, Saul Schwartz, and Eugene Solensky, "Work and Welfare as Determinants of Female Poverty and Household Headship," *Quarterly Journal of Economics*, 1982, vol. 97, no. 3, pp. 519-34; David T. Ellwood and Mary Jo Bane,

"The Impact of AFDC on Family Structure and Living Arrangements," Report on Grant 92A-82, unpublished paper (Washington, U.S. Department of Health and Human Services, 1984); Wilson and Neckerman, "Poverty and Family Structure," Martha E. Giminez, "The Feminization of Poverty: Myth or Reality?" *The Insurgent Sociologist*, 1985, vol. 75, pp. 5-30; and David T. Ellwood and Lawrence Summers, "Poverty in America: Is Welfare the Answer or the Problem?" in Sheldon H. Danziger and Daniel Weinberg, eds., *Fighting Poverty* (Cambridge, MA, Harvard University Press, 1986).

¹⁴ Joan Smith, "The Paradox of Women's Poverty: Wage Earning Women and Economic Transformation," in Barbara Gelpi, Nancy Hartscock, Clare C. Novak, and Myra Strober, eds., *Women and Poverty* (Chicago, University of Chicago Press, 1986).

¹⁵ Laurie Bassi, "Poverty Among Women and Children: What Accounts for the Change?" *American Economic Review*, 1988, vol. 78, no. 2, pp. 91-95.

States act to improve literacy of workers

Comprehensive programs or policy initiatives designed to improve the literacy rate of workers have been developed in nine States. A report of the Council of State Policy and Planning Agencies profiles the literacy plans of these States. The Council's State Policy Academy group assisted officials of the States in defining problems related to literacy, determining appropriate goals and objectives, and developing approaches to ease the problems. One problem the Academy found common in all States was the growing disparity between the literacy levels of certain segments of the work force and the level of skills required to obtain jobs or advancement. The report outlines three methods used by the States to improve literacy—comprehensive, special project, and "groundwork."

Comprehensive approach. In Florida, policymakers emphasized the problem of adults who lacked functional literacy skills needed to participate in economic growth opportunities. The State, assisted by the Academy, developed the Florida Adult Literacy Plan. The plan has two objectives to attain by 1995: to reduce Florida's basic skills (fourth-grade level) illiteracy rate from 3.5 per-

cent of the adult population to 2 percent, and to reduce the functional skills (ninth-grade level) illiteracy rate from 18 percent of the adult population to 10 percent. The plan fits into the State's recent welfare reform measures because it ties literacy enhancement to reduction of welfare dependency. Local school districts will provide literacy services to populations named through State inter-agency plans.

Special project approach. According to lawmakers in Tennessee, one-third of the State's adult population still believes that little or no education can carry a worker through a lifetime of productivity. The State's literacy plan has 13 objectives. Among them are objectives to increase the high school literacy rate, create work force literacy programs, form a Literacy Volunteer Corps, and increase the funding for State literacy by 400 percent. Although the funding increase was not fully appropriated, several new programs have begun, and 207 businesses in private industry support the overall program.

Groundwork approach. Idaho's literacy plan was in response to two major problems: more than half of the State's dislocated workers and poverty-stricken adults do not have high school diplomas, and the State's investment in public schools is low—about \$8 per adult served. The literacy improvement plan includes increasing public awareness of the literacy problem, increasing the State's funding for literacy, and increasing public and private collaboration and support. The initiative is part of the Governor's Workforce 2000 Task Force.

THE REPORT ALSO profiles the literacy plans for Massachusetts, Michigan, Missouri, North Carolina, Utah, and Virginia. The full report, *Enhancing Literacy for Jobs and Productivity: Academy Final Report*, is available from the Council of State Policy and Planning Agencies, 400 North Capitol Street, Washington, DC 20001 —Laurie B. Lande, Office of Publications. □

No. 658. Effective Federal Minimum Hourly Wage Rates, 1950 to 1992, and Coverage in 1990

[Employee estimates as of September 1990, except as indicated. The Fair Labor Standards Act of 1938 and subsequent amendments provide for minimum wage coverage applicable to specified nonsupervisory employment categories. Exempt from coverage are executives and administrators or professionals.]

IN EFFECT	MINIMUM RATES FOR NONFARM				SEX, RACE, AND INDUSTRY	NONSUPERVISORY EMPLOYEES, 1990 -				
	Laws prior to 1966 ¹	Percent avg. earnings ²	1966 and later ³	Minimum rates for farm workers ⁴		Total (1,000)	Subject to minimum wage rates			
							Total (1,000)	Percent of total	Prior to 1966 ⁵ (1,000)	1966 and later ⁷ (1,000)
Jan. 25, 1950	\$0.75	54	(X)	(X)	Total	82,867	82,080	88.4	51,379	30,671
Mar. 1, 1956	1.00	52	(X)	(X)						
Sept. 3, 1961	1.15	50	(X)	(X)	Male	47,093	41,467	88.1	27,826	13,841
Sept. 3, 1963	1.25	51	(X)	(X)	Female	45,764	40,583	88.7	23,753	16,830
Feb. 1, 1967	1.40	50	\$1.00	\$1.00	White	81,889	71,921	88.0	45,882	26,038
Feb. 1, 1968	1.60	54	1.15	1.15	Black and other	11,168	10,129	90.7	5,497	4,632
Feb. 1, 1969	(X)	51	1.30	1.30	Black only	10,161	9,216	90.7	5,013	4,203
Feb. 1, 1970	(X)	49	1.45							
Feb. 1, 1971	(X)	46	1.60	(X)	Private industry	81,888	70,891	86.6	51,379	19,502
					Agriculture	1,704	654	38.4	-	654
May 1, 1974	2.00	46	1.80	1.80	Mining	853	649	99.4	649	-
Jan. 1, 1975	2.10	45	2.00	1.80	Construction	4,898	4,823	98.5	4,098	727
Jan. 1, 1976	2.30	46	2.20	2.00	Manufacturing	16,916	16,448	97.2	16,345	103
Jan. 1, 1977	(X)	42	2.30	2.20	Transp., public utilities	5,243	5,200	99.4	5,130	78
Jan. 1, 1978	2.65	44	2.65	2.65	Wholesale trade	5,474	4,370	79.8	4,104	266
Jan. 1, 1979	2.90	45	2.90	2.90	Retail trade	17,894	16,205	90.6	7,999	8,206
Jan. 1, 1980	3.10	44	3.10	3.10	Finance, insurance, real estate	5,868	4,449	75.8	4,275	174
Jan. 1, 1981	3.35	43	3.35	3.35	Service	21,705	17,174	79.1	8,781	8,393
Apr. 1, 1990	3.80	35	3.80	3.80	Private households	1,333	900	67.5	-	900
Apr. 1, 1991	4.25	38	4.25	4.25	Government	11,169	11,169	100.0	-	11,169
Apr. 1, 1992	(X)	37	(X)	(X)						

¹ Represents zero. ² X Not applicable. ³ Applies to workers covered prior to 1961 Amendments and, after Sept. 1965, to workers covered by 1961 Amendments. Rates set by 1961 Amendments were: Sept. 1961, \$1.00; Sept. 1964, \$1.15; and Sept. 1965, \$1.25. ⁴ Percent of gross average hourly earnings of production workers in manufacturing. ⁵ Applies to workers newly covered by Amendments of 1966, 1974, and 1977, and Title IX of Education Amendments of 1972. ⁶ Included in coverage as of 1966, 1974, and 1977 Amendments. ⁷ No change in rate. ⁸ Includes workers in retail-service establishments with less than \$250,000 in gross annual sales which are part of enterprises covered under criteria in effect prior to the 1966 Amendments. These workers became subject under the 1974 Amendments. ⁹ Currently employed workers subject to provisions. ¹⁰ Estimates based on average employment for the jan-month active season. ¹¹ Estimates for educational services in private industry and government relate to October. ¹² Federal, State, and local employees.

Source: U.S. Department of Labor, Employment Standards Administration, *Minimum Wage and Maximum Hours Standards Under the Fair Labor Standards Act, 1981*, annual, and unpublished data.

No. 659. Workers Paid Hourly Rates, by Selected Characteristics: 1992

[Average of the four quarters ending in the first quarter of 1992; for employed wage and salary workers. Based on Current Population Survey, see text, section 1, and Appendix B.]

CHARACTERISTIC	NUMBER OF WORKERS ¹ (1,000)				PERCENT DISTRIBUTION			PERCENT OF ALL WORKERS PAID HOURLY RATES		
	Total paid hourly rates	At or below \$4.25		Total paid hourly rates	At or below \$4.25		Total	At or below \$4.25		Total
		Total	At \$4.25		Total	At \$4.25		Total	At \$4.25	
Total, 16 years and over ²	61,782	5,716	3,365	2,351	100.0	100.0	100.0	9.3	5.4	3.8
16 to 24 years	14,135	2,915	1,760	1,155	22.9	51.0	52.3	20.6	12.5	8.2
16 to 19 years	4,964	1,660	1,033	627	8.1	28.0	30.7	33.3	20.7	12.6
25 years and over	47,647	2,801	1,604	1,197	77.1	48.0	47.7	5.9	3.4	2.5
Male, 16 years and over	31,010	2,062	1,301	761	50.2	36.4	38.7	33.2	6.7	4.2
16 to 24 years	7,335	1,248	788	460	11.9	21.8	23.4	19.6	17.0	10.7
16 to 19 years	2,508	732	480	252	4.1	12.8	14.3	10.7	29.2	19.2
25 years and over	23,675	834	513	321	38.3	14.6	15.2	3.5	2.2	1.4
Women, 16 years and over	30,771	3,634	2,064	1,570	49.8	63.6	61.3	66.8	11.8	6.7
16 to 24 years	6,800	1,667	972	695	11.0	29.2	28.9	24.5	14.3	10.2
16 to 19 years	2,477	928	553	375	4.0	16.2	16.4	16.0	37.5	22.3
25 years and over	23,972	1,667	1,091	876	38.8	34.4	32.4	37.3	8.2	4.6
White	51,776	4,673	2,691	1,982	83.8	81.8	80.0	84.3	9.0	5.2
Black	7,927	874	561	313	12.8	15.3	16.7	13.3	11.0	7.1
Hispanic origin ³	5,908	655	474	181	9.6	11.5	14.1	7.7	11.1	8.0
Full-time workers	45,854	2,148	1,358	788	74.2	37.5	40.4	33.5	4.7	3.0
Part-time workers	15,928	3,570	2,006	1,564	25.8	62.5	59.6	66.5	22.4	12.6
Private sector	53,607	5,319	3,102	2,217	86.8	93.1	92.2	94.3	9.9	5.9
Goods-producing industries ⁴	17,763	709	481	228	28.8	12.4	14.3	9.7	4.0	2.7
Service-producing industries	35,822	4,610	2,620	1,990	58.0	80.7	77.9	84.6	12.9	7.3
Public sector	8,199	397	263	134	13.2	6.9	7.8	5.7	4.9	3.2

¹ Excludes the incorporated self-employed. ² Includes races not shown separately. ³ Persons of Hispanic origin may be of any race. ⁴ Working fewer than 35 hours per week. ⁵ Includes agriculture, mining, construction, and manufacturing. Includes transportation and public utilities; wholesale trade; finance, insurance, and real estate; private households; and other service industries, not shown separately.

Source: U.S. Bureau of Labor Statistics, unpublished data.

Minimum Wage Laws: Are They Overrated?

Charles Brown

Since the Fair Labor Standards Act was passed in 1938, the minimum wage has averaged a bit less than half of average hourly earnings. Typically, the minimum has been fixed in nominal terms at about 55 percent of the current average wage. Rising wages in the rest of the economy gradually erode the real minimum wage and eventually the process is repeated. Sometimes the increase in the nominal minimum is accompanied by a (permanent) reduction in those businesses exempted from the law. Proposals for a lower minimum wage for young workers or to index the minimum wage to the average wage have been debated but not adopted.

The minimum wage was last increased (to \$3.35) in 1981. Since then, average hourly wages have risen by 25 percent, eliminating any momentum for a lower minimum wage for youth but reviving proposals for another increase in the nominal minimum.

Economists are fascinated by the minimum wage because we have strong theoretical predictions about the direction of the effect of the minimum wage on employment, and fairly widely accepted methods to estimate the size of that impact. (It probably didn't hurt that the earliest (and later) estimates lined up well with the predictions.) But that is not the only reason for our fascination with the topic. Depending on whether we include those who say they earn *less* than the minimum wage, "minimum wage workers" account for 6 to 12 percent of those employed (Gilroy, 1981, p. 157) and less than 5 percent of wage and salary income. The minimum wage gives economists a relatively rare opportunity to study the impact of an exogenous increase in the price of labor, and thus a chance to refine our thinking about labor markets more generally.

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I think there is a reasonably high degree of agreement in studies of the impact of the minimum wage on employment, unemployment, and the distribution of income. For example, Eccles and Freeman (1982) pointed out the striking agreement between research sponsored by the "liberal" Minimum Wage Study Commission and the "conservative" American Enterprise Institute (their characterizations) on the minimum wage. I will also point to a few areas where further work could refine our understanding of labor markets, and perhaps even change the prevailing view of the impact of the minimum wage.

The Textbook Minimum Wage Theory

*Prediction
of reduced
employment*

An introductory textbook without a discussion of minimum wage laws might not be like a day without sunshine, but would certainly rank with a morning without caffeine. With relatively few refinements, that simple model—in which a minimum wage above the free-market equilibrium wage for "unskilled" labor moves the economy back along the demand curve for such labor, reducing employment—really does summarize the heart of the matter.¹ Because we're moving *along* the demand curve, the proportional change in employment in response to a change in the minimum wage is simply equal to the elasticity of demand for unskilled labor times the proportional wage increase. Earnings of unskilled workers as a group rise if demand is inelastic, and fall if it is elastic. But it's important to be careful about a few details in the simple textbook model.

*Variations
on the model*

As always, the "prediction" of reduced employment is an other-things-equal claim; one who reads even a tiny sample of public discussion is likely to be amazed how often this point is missed. During the 1977 Congressional hearings on the minimum wage, for example, much was made of the fact that, in the year following previous increases in the minimum wage, employment had risen and unemployment had fallen or remained constant (Subcommittee on Labor Standards, 1977, p. 34, 51). Ten years later, matters were even more confused in testimony before the Subcommittee on Labor Standards (1987, p. 9): "... the arguments that were put forth [in 1977] were, 'There will be a loss of jobs. People will go out of business. It is an unfair imposition.' Again, history and experience point out clearly that there is no basis for that argument. More than 11 million new jobs have been created since 1981 and productivity is up 6 percent—all of this with a 27 percent increase in private wages." Unfortunately for this line of argument, the real minimum wage had been *falling since 1981!*

A few other simple clarifications should be stressed. The reduction in employment predicted in the standard model is not necessarily accomplished by that number (or any number) of workers being discharged; since turnover rates in minimum wage jobs are on the order of 12.5 percent *per month* (Converse et al., 1981, p. 264), attrition is a

¹The textbook exception of the monopsonist whose employment rises in response to a skillfully set minimum wage has little impact on the minimum wage literature outside of textbooks, in large part because the company town is not (if it ever was) the context of most minimum wage employment. I'm not sure how to summarize the attitude of the "typical" dual labor market economist on the minimum wage, but I *think* most agree it is likely to reduce employment.

speedy method of adjustment.² That turnover rate also suggests that one should be careful about contrasting "those lucky enough to work at a higher wage" with "those who are unable to find work;" with high turnover rates, the two groups *may* be composed of largely the same people at different moments.

Finally, unemployment due to the minimum wage as it would be measured in official statistics cannot be represented simply in the typical textbook diagram: those who would like to work at the minimum wage but are not employed may (if they actively look for work in the previous month) or may not (if they don't) be counted as unemployed by the Bureau of Labor Statistics.

A simple extension of the textbook model assumes that, while the number employed depends on the wage, the number of labor force participants (those working or looking for work) depends on the wage and the proportion of such participants who are in fact employed. Since employment also depends upon the minimum wage, the model can be solved for labor force as a function of the minimum wage alone. In general, an increase in the minimum can either increase or reduce the number of labor force participants and the unemployment (the difference between labor force and employment) which results can be either greater or less than the reduction in employment.

The simple response of the market for unskilled labor described so far leads to changes in other markets as well. Employers have an incentive to use more of other inputs, such as more skilled labor, if those inputs are substitutes for the now more expensive unskilled labor. This leads to greater employment and higher wages for such inputs when the general equilibrium response to the minimum wage is completed. Of course, the reverse occurs for inputs which are complements for unskilled workers.

Complications: Partial Coverage and Heterogeneous Workers

To interpret the empirical estimates of the effect of the minimum wage correctly, it is important to recognize two complications. First, the Fair Labor Standards Act has exempted some employers (generally small ones) from the minimum wage, with the standards of "smallness" gradually being tightened over time. In 1950, half of all private non-farm non-supervisory wage and salary workers were subject to the minimum wage; since 1977, about 5/6 have been subject. Today, the uncovered sector consists mostly of small retail trade and service employers.

Models of the impact of the minimum wage with partial coverage assume that employment in the covered sector is determined by demand, so the proportional reduction in employment in that sector is the elasticity of demand times the proportional change in the wage in the covered sector. Even if there is no response in the uncovered sector (a simple but unlikely case), the proportional change in total

²I stress this point because failure to see such discharges when the minimum wage is raised makes the untutored citizen skeptical of our wisdom on the subject. Sometimes, even the tutored are misled: see, for example, U.S. Department of Labor (1965, p. 6), where considerable stress is placed on the tiny number of reports of layoffs and plant closings following the 1961 increase in the minimum wage.

employment (the dependent variable in the typical empirical study) will be smaller than the proportional change in employment in the covered sector.

Modeling the response of the uncovered sector to the minimum wage is complicated by the variety of ways in which workers (all of whom would prefer to work at the higher covered-sector wage) may get sorted into covered- and uncovered-sector jobs.³ One assumption is that all those willing to work at the minimum wage apply for jobs in the covered sector, employers choose among them, and those not chosen work in the uncovered sector (if their reservation wage is less than the wage there) or do not work (if their reservation wage is greater than the wage in the uncovered sector). In this case, one can show that the minimum wage leads some of those who would otherwise have found jobs in the covered sector to be employed in the uncovered sector. This cushions the employment loss in the covered sector. Such a process, however, has distributional drawbacks (wages in the uncovered sector fall) and efficiency costs (too much labor is allocated to the uncovered sector, too little to the covered sector). Moreover, one can no longer deduce the impact of an increase in the minimum wage on the earnings of unskilled workers from a comparison of the proportional change in employment and the proportional change in the minimum wage, since the proportional increase in the average hourly wage of (both covered and uncovered) workers is less than the proportional increase in the minimum wage.

An alternative approach to modeling the allocation of workers across sectors is to assume that workers choose their sector. Those working in the uncovered sector earn W_u and have no difficulty finding work at that wage (because the uncovered sector wage is assumed flexible). Those working in the covered sector earn W_m when employed, but have some probability $P < 1$ of having such a job, equal to the ratio of covered sector employment to covered sector participants (employed plus unemployed). Ignoring risk aversion, transfer payments to the unemployed, and the distinction between new entrants and incumbents (that is, assuming unskilled jobs turn over frequently),⁴ workers choose their sector based on expected earnings (wage times probability of having a job). They work in the covered sector if $PW_m > W_u$, and in the uncovered sector if $PW_m < W_u$. Equilibrium requires that $W_u = PW_m$.

Since workers care about expected earnings, and these are equal in the two sectors, the number of labor force participants is a function of W_u or, equivalently, PW_m . The total number of participants must in equilibrium equal the number employed (in both sectors) plus the number unemployed (looking for jobs in the covered sector).

As the preceding discussion implies, allowing workers to choose their sector considerably complicates the analysis. It does, however, maintain the theoretical link between the minimum wage and that unemployment which comes from queuing for minimum wage jobs. Moreover, it points out the possibility that workers will flow from the uncovered sector to the covered sector. If covered sector demand is inelastic, and workers' sectors and W_u are temporarily frozen, the minimum wage raises expected

³The classic two sector models of the minimum are Gramlich (1976), Mincer (1976) and Welch (1976).

⁴For treatments of more complicated cases, see Gramlich (1970), Mincer (1976), and Brown, Gilroy, and Kohen (1982).

earnings in the covered sector ($PW_m > W_u$). Equilibrium can be restored only if some workers "migrate" to the covered sector, raising W_u and reducing P until $PW_m = W_u$.

Whatever model one chooses, the *basic* message for empirical work remains: one must account for the extent of coverage, and the elasticity of total unskilled employment with respect to the minimum will be smaller than the elasticity of demand.

② The second complication for empirical work arises from the fact that minimum wage workers bear no unique identifying mark besides their wage rate. While being young, black, female, or poorly educated, or living in a low wage area will increase one's chances, any available data series on employment will combine minimum wage and higher-paid workers. Employment of higher-paid workers is not directly reduced by an increase in the minimum wage; if, for example, better-paid teenagers are substitutes for minimum wage teenagers, an increase in the minimum wage would increase better-paid teens' employment. Even if their employment is not affected at all, the elasticity of total teenage employment with respect to the minimum wage is equal to the elasticity of demand for minimum wage teens' labor times their share of teenage employment.

A more interesting and complex view emerges if labor quality or skill is modelled as continuously variable. Suppose the minimum wage rises from \$3.35 to \$3.85 per hour. Those previously earning \$3.90 per hour, who are presumably good substitutes for those who used to earn \$3.85 or less, enjoy an increase in demand for their labor. This raises their wage somewhat and suggests an upward "ripple effect" on even better-paid workers. Apart from Pettengill's (1981) work, neither proponents nor opponents of the minimum wage have given such ripples careful theoretical attention in analyzing the effect of the minimum wage on employment.

Assume a continuous distribution of workers' skills, and thus a continuous wage distribution in the absence of a minimum wage. What will happen to the wage distribution if a minimum wage is now imposed?

I suspect most readers answered that the minimum wage leads to the disappearance of the portion of the wage distribution below the new minimum, as employers discharge (or refuse to hire) those with value of marginal product below the minimum. I know I would have given that answer.

A look at an actual wage distribution gives a quite different view. Rather than being truncated at the minimum wage, there is an obvious spike at that point. As noted above, 6 percent of those employed in 1980 reported a wage equal to (actually, within five cents of) the minimum wage. If one focuses on a low-wage group, the spike is more pronounced; for example, just over a third of teenagers in retail trade and service industries earned the minimum wage in 1978 (Fritsch, 1981, p. 24), including a fifth of those working in establishments not legally subject to the minimum wage.⁵

Explaining this spike has not received much attention in the literature, and at first glance it is puzzling. Suppose workers are measured by "efficiency units," where a worker's efficiency units equal the wage that should be received in the absence of a

⁵In 1980, the minimum wage was \$3.10, and those earning \$3.05 to \$3.15 were counted as receiving the minimum. In 1978, the minimum wage was \$2.65, and those earning \$2.65-\$2.69 were counted as receiving the minimum. The count of those earning the minimum is therefore *not* boosted by counting the relatively large number of workers reporting round-dollar amounts like \$3.00.

Can't
also
look
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ripple
better paid
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paid

wage
distribution

*Why a spike -
minimum wage
plus profits
in the
workers*

minimum wage. Now a minimum wage of \$3.35 is imposed, and a spike appears in the wage distribution at that point. This means that workers who earned different wages in the absence of the minimum wage (and hence embody different numbers of efficiency units of labor) are earning the same wage. But if employers find it profitable to employ the worst of these workers at \$3.35, they would prefer instead to hire the best at slightly more than \$3.35. If so, to mix a metaphor, the spike should unravel.

One plausible explanation is that employers *are* paying the best of these workers more than the worst, but they are using non-wage forms of compensation. The hidden bonus (to the best) or hidden penalty (on the worst) could take several forms; changes in on-the-job training, fringes, workweek, or effort have all been suggested as possible consequences of the minimum wage, though not necessarily in the context of "the spike." Suppose, however, that employers do require greater effort from those with fewer efficiency units of labor, so that the marginal products of all those paid the minimum wage in the covered sector were equal. Why would a significant fraction of employers not bound by the law choose to pay the minimum wage, as the evidence suggests they do?⁶ Whether a complicated market clearing explanation or a simpler appeal to fairness (with the minimum wage essentially defining what is fair) provides a better answer needs to be explored.

Estimated Impact on Employment and Unemployment

If policy makers are not completely certain about the size of the effect of the minimum wage on employment and unemployment, it is not for lack of trying on the part of economists—there have been over two dozen time series studies of the effect of the minimum wage on teenagers, and nearly as many other studies focused on slightly different issues, primarily cross-sectional studies of youth, low-wage areas, and low wage industries. (For a survey, see Brown, Gilroy, and Kohen, 1982.) I will focus here primarily on the time series studies of teenagers.

A typical study of this genre regresses either the employment-to-population ratio or the unemployment rate of teenagers on a minimum wage variable, an indicator of aggregate economic conditions (like the adult male unemployment rate), a time trend, and perhaps other variables such as the fraction of youth in the armed forces or the size of the teenage population relative to the entire population of labor force age.

While for convenience one refers to "the" minimum wage, quite often there are two minimum wages. When the coverage of the law is increased, and the minimum wage raised, a lower minimum wage W_m^* is sometimes introduced for the newly covered employers, which then rises toward the "basic" minimum W_m until the latter applies to all covered employers. Most studies combine the coverage and level of the minimum wage into a single minimum wage index, by weighting W_m^* and W_m by the proportion of workers to which they apply—proportions which sum to less than one

⁶Holzer, Katz, and Kruger (1987) are investigating whether the minimum wage creates a queue of jobseekers, as would be expected if attempts to offset the minimum wage by increasing effort and so on were only partially successful.

because no minimum wage applies to some workers—and dividing by the average wage.

If one asks of the two dozen time series studies, "What is the estimated impact of a 10 percent increase in the minimum wage on teenage employment?" the answer comes back, "It falls by 1 to 3 percent." If one focuses on studies which include a time trend and control for coverage (either as a separate variable or in the combined form discussed above⁷) the estimates are 1 to 2 percent. This effect translates into an estimated increase in the teenage unemployment rate in a range from zero to 3 percentage points. More recent studies which include the 1970s, and studies which control for the teenage population share, produce estimates of a rise in teenage unemployment rates of .75 percentage points or less. As noted above, however, unemployment may increase most sharply in precisely the situation (inelastic covered sector demand) where average earnings of the unskilled as a group rise. So the unemployment rate deserves less focus than it gets in public discussions.

Together, the employment and unemployment effects estimated by the typical study suggest a reduction in labor force participation due to the imposition of a minimum wage. If one accepts the idea that labor force participation is an increasing function of the average rewards from participating in the labor force, it appears these rewards are reduced for teenagers by the minimum wage. However, the reduction in labor force participation does not show up as an increase in "discouraged workers," those who are not officially counted as unemployed because they have given up active job search, so the labor force withdrawal is somewhat puzzling.

If the minimum wage has negative effects on teenage employment, one would almost certainly expect to find larger (proportional) effects on employment of non-white teenagers, because a larger proportion of non-white teenagers are working at the minimum wage. Studies which address this question show very mixed results, with blacks more adversely affected than whites only about as often as the reverse, and in any case with large standard errors for the effects on blacks. If one looks to the theory for signs but the data for magnitudes, one probably should conclude that the effect of a minimum wage on black teenagers is worse than that on white teenagers, but not dramatically so.

Thus, my reading of the time series estimates is that they are not negligible—especially when 30 percent increases in the minimum wage are under discussion in Congress—but one should look elsewhere (and I am not sure where) for the primary causes of high unemployment rates in the youth labor market, particularly for black youth.

There appear to be no published studies of the consequences of the gradual repeal of the minimum wage (as rising wages elsewhere eroded a fixed nominal minimum) since 1981. An imperfect alternative, which ignores changes in age

⁷When coverage is entered separately, its effect tends to be imprecisely estimated—perhaps because, as noted above, there is some tendency for uncovered employers to match the minimum wage. But it's hard to see an *a priori* case for excluding it altogether, as some studies with relatively large estimates of the impact of the level of the minimum wage have done. The most detailed treatment of coverage is Al-Salam, Quester, and Welch's (1981) paper.

African
American
youth

Table 1
Teenage Labor Market in the 1980s

<i>Variable</i>	<i>1980</i>	<i>1981</i>	<i>1982</i>	<i>1983</i>	<i>1984</i>	<i>1985</i>	<i>1986</i>
Minimum Wage	\$3.10	\$3.35	\$3.35	\$3.35	\$3.35	\$3.35	\$3.35
Average Hourly Earnings (all ages)	\$6.66	\$7.25	\$7.67	\$8.20	\$8.33	\$8.57	\$8.76
MW/AHE (%)	46.5	46.2	43.7	41.7	40.2	39.1	38.2
Unemployment Rate Aggregate (%)	7.1	7.6	9.7	9.6	7.5	7.2	7.0
Unemployment Rate Males age 20 + (%)	5.9	6.3	8.8	8.9	6.6	6.2	6.1
Employment-Population Ratio Teenagers (%)	46.6	44.6	41.5	41.5	43.7	44.4	44.6
Unemployment Rate Teenagers (%)	17.8	19.6	23.2	22.4	18.9	18.6	18.3
Employment-Population Ratio Black Teenagers (%)	23.8	21.9	19.0	18.7	21.9	24.6	25.1
Unemployment Rate Black Teenagers (%)	38.5	41.4	48.0	48.5	42.7	40.2	39.3

structure of the population, the availability of training for those not employed, and other factors held constant in more formal studies, is simply to look at what has happened to the youth labor market over this period. Some relevant figures are presented in Table 1. The first three lines show that the erosion of the minimum wage has been substantial. The next two lines show the aggregate and adult male unemployment rates, two alternative measures of the state of the overall labor market, which must be held constant in looking for effects of the minimum wage. The overall unemployment rate suggests comparing 1984 to 1981 and 1985-86 to 1980, while the adult male rate suggests treating 1984-86 and 1981 as comparable. But regardless of the comparison, this quick look at the evidence provides little support for the idea that the 20 percent reduction in the relative minimum wage had major positive effects on teenage employment; indeed, the employment-population ratio for teens is lower afterwards than it was before the minimum wage cut, while the unemployment rate comparisons are mixed and show uniformly small changes.⁸ There is some improvement in the employment of black teens (depending on one's choice of the right comparison, it is up by as much as two points or 9 percent), though the unemployment numbers of black teens are less cheering.

The thrust of the preceding paragraphs is that the effects of the minimum wage on teenage employment and unemployment are smaller than one might have guessed (certainly smaller than I would have guessed). Less numerous studies of 20- to 24-year-olds suggest smaller proportional effects for "older youth," as one would expect from the fact that a smaller proportion of workers in this age bracket are

⁸ Research in progress by Alison Wellington suggests that the impact of the minimum wage on youth looks less severe when the sample period is extended to include the 1980s.

minimum wage workers. However, two strands of evidence do suggest more noteworthy effects of the minimum wage on youth labor markets.

Effects
on
youth
market

The first strand is the somewhat fragmentary evidence that minimum wages increase the proportion of employed teenagers who are part-time workers (Gramlich, 1976).⁹ The evidence is fragmentary because time series of youth employment by part- and full-time status began about ten years after the beginning of the all-teen time series used in other studies. Perhaps as a result, the size of the shift to part-time work in response to the minimum wage bounces around according to the particular estimating equation (Brown, Gilroy, and Kohen, 1983). There is complementary evidence (Mattila, 1981) that increases in the minimum wage increase school enrollment, perhaps because they increase the difference in expected earnings between dropouts and high school graduates. Since existing studies of the part-time issue used time series running from 1963 to the mid- or late 1970s, the 6 to 10 years additional data now available justify an update.

The second piece of evidence suggesting larger disemployment effects is a cross-section study by Meyer and Wise (1983).¹⁰ In this model, the wages of young workers in the absence of the minimum wage depend on their personal characteristics and an error term. For those who would otherwise earn less than the minimum, passage of a minimum wage can do one of three things: cost them their job, leave them unaffected (if their job is not covered, or if their employer ignores the law), or result in their wage being raised up to the minimum.¹¹ (Recall the wage distribution's discernable spike at the minimum wage.) Loosely speaking, Meyer and Wise estimate the parameters of the wage distribution from the segment of the distribution above the minimum wage, and extrapolate that distribution back below the minimum to predict the number of young workers who would be employed at each wage below the actual minimum if there were no minimum. The difference between fitted and actual distributions below the minimum measures the extent of disemployment.¹² Their simulations suggest a 10 percent increase in the minimum wage reduces teenage

⁹The finding that higher minimum wages reduce workweeks raises an interesting theoretical issue. Employers pay higher wages to full-time than to part-time workers, suggesting that value of output per hour is higher on full-time schedules. If the observed change in workweek is a response by employers to the higher minimum wage, they should be increasing the workweek to raise the average value of output produced per hour up to the new minimum wage (Barzel, 1973). But if firms raise average output per hour by limiting on-the-job leisure ("coffee breaks"), paid hours per week would fall.

¹⁰I place less weight on the more traditional cross-section studies, which try to explain cross-state differences in youth employment-population ratios by a cross-state minimum wage index. With a national minimum wage (admittedly, with some variation in proportion covered due to differences in industrial structure and state minimum wage laws), most of the variation in the coverage-weighted relative minimum comes from variation in average wages across states. We might expect more youth to work in states where average wages are higher, which would produce a negative coefficient for the minimum wage variable in these studies, even if the minimum wage had no effect.

¹¹The Meyer and Wise approach therefore abstracts from any effect of the minimum wage on wages below the minimum, or the possibility of upward "ripples" above the minimum.

¹²Meyer and Wise are keenly aware of the fact that their method leans heavily on the assumed functional form of the earnings function and particularly the error term. In addition to some sensitivity tests, they also estimate the wage distribution in a year with a high minimum wage and use the parameters to estimate the effect of the minimum in a low minimum wage year. The estimates line up well with what one gets using the "fuller" wage distribution from the low minimum wage year directly.

employment by somewhat more than the 1 to 2 percent in the time series studies.¹³ One weakness in the Meyer and Wise study for our purposes is that their estimates apply to out-of-school youth. Mattila's (1981) time series evidence suggests disemployment effects are particularly large for that group.

A Lower Minimum Wage for Teenagers?

If the ideal law for defenders of the minimum wage is an indexed minimum that cannot be eroded by increases in nominal wages throughout the economy, the constrained optimum for some opponents is to enact a lower minimum wage for youth. Curiously, while economists have few good things to say about minimum wage laws and support for a differential minimum wage for young workers tends to come from opponents of higher minimum wages, there seems to be little evidence of widespread enthusiasm among economists for a youth "subminimum."

The basic issues are fairly straightforward. Traditional minimum wage legislation changes the relative price of minimum wage workers, both youth and adults, relative to better-paid youth and adults. A subminimum, however, reduces the price of low wage teenagers compared to low-wage adults as well as better-paid workers of all ages. Thus, the subminimum should increase teenage employment, for the usual reasons: it makes output produced by low-wage teenagers cheaper (scale effect), and encourages employers to substitute low-wage teens for other inputs (substitution effect).

While there is little solid evidence on the point, it seems plausible that low-wage teenagers and low-wage adults are good substitutes. Perhaps they are not perfect substitutes—for example, they probably have different constraints on the hours they will work and perhaps different combinations of ability and reliability—but overall it is hard to see *a priori* how they could fail to be good substitutes. Thus, *part of* the gains of low-wage teenagers might be expected to come at the expense of low-wage adults (with the remainder coming from the scale effect and substitution against other inputs).¹⁴ Moreover, past changes in the minimum wage law do not offer the natural experiment needed to estimate with confidence the relative size of the adult loss relative to the teen gain.

If one finds a proposal which encourages substituting low-wage teens for low-wage adults (who are at least somewhat more likely to be poor) to be ironic, one should not overlook the irony of the present law. The Fair Labor Standards Act has permitted, on a gradually more liberal basis, employers to hire full-time students working during

¹³They report that holding the nominal minimum wage at \$1.60 would have increased teenage employment by 5 percent. Since the minimum wage averaged \$2.21 over the four years they studied, they were in effect considering a 28 percent reduction. However, this brings the minimum wage well below the historical range compared to average hourly earnings, and the elasticity of employment with respect to the minimum falls in absolute value as one considers successively lower values of the minimum.

¹⁴Whether a youth subminimum is efficient (given a minimum wage in the first place) is unclear. While it reduces the underutilization of unskilled youth, it intensifies the underutilization of unskilled adults.

the summer (or part-time during the school year) at 85 percent of the minimum wage. Here, the substitution which seems to be encouraged is to hire (advantaged?) youth still in school instead of (less advantaged?) dropouts. Mercifully, even in 1979 (a high-use year) students hired under this subminimum accounted for less than 5 percent of student employment, and there is no evidence of substitution effects exceeding scale effects for non-student youth (Freeman, Gray, and Ichniowski, 1981).

There is a further irony in the debate over a differential minimum wage for youth. Earlier, I noted that an absence of evidence of widespread discharges following minimum wage increases had led some supporters of the minimum to doubt that it was causing any significant loss of employment. The same logical error seems to have crept into the thinking of those critics of the minimum wage who support a youth differential. To respond to charges that a youth differential will lead employers to substitute now-cheaper youth for adults, proposed youth differential bills invariably include a provision making it illegal for employers to discharge adults in order to hire teenagers. The existing subminimum for students has a similar provision, and it is a "dead letter" (Freeman, Gray, and Ichniowski, 1981, p. 309).

Effect of the Minimum Wage on the Income Distribution

If the minimum wage is increased by 10 percent, roughly a quarter of teenagers (closer to half if one counts those below the minimum) get a 10 percent increase in their wage, while (according to the time series estimates) 1 to 2 percent are no longer employed. Unless wages fall precipitously in the uncovered sector, or hours reductions are large, teens as a group seem to gain.¹⁵ If one can get past these qualifications, and assumes that, proportionally, things work about the same for low-wage adults as for teenagers, one might see an iffy case for an increase in the minimum wage to reduce poverty.

One of the more surprising findings in the minimum wage literature is that, even under the most favorable assumption that the minimum wage had *no* disemployment effect, its effect on poverty or the income distribution is not very large. The reason is the surprisingly weak relationship between being a worker whose hourly wage is low and being a member of a family whose annual income is low.¹⁶ Many poor families have no earners at all, or earners whose wage is above the minimum but cannot work enough hours per year. While there are a number of ways of expressing this correlation, Johnson and Browning's (1983) simulation is perhaps the most dramatic. They find that in 1976, when the minimum wage was \$2.30, earnings of workers making less than \$2.80 per hour accounted for only 11 percent of the after-tax, after transfer income of the poorest fifth of all households. Consequently, even a 22 percent

¹⁵ Meyer and Wise show that, assuming work weeks and wages below the minimum are unaffected, their (high-side) effects on employment leave teenagers' earnings unaffected by the minimum wage.

¹⁶ Some evidence on the weakness of this correlation was first presented by Stigler (1946). More recent studies, with more broad-based samples, include Kelly (1976), Gramlich (1981), Bell (1981), and Knieser (1981). Burkhauser and Finegan (1987) show that the correlation was once considerably stronger.

increase in the minimum wage with no loss of employment raises the income of these households by less than one percent.

To be fair, the finding that low-wage workers are often not members of low-income households ought to temper the claims of opponents of the minimum wage that it is a particularly bad idea for the poor. But if one is to overcome an economist's natural reluctance to mess with markets by pointing to distributional gains, the limited nature of these gains under even favorable assumptions about employment effects leaves one grasping (and perhaps gasping) for other tools emphasizing regular full-time employment and/or direct transfers.

Conclusions and Regrets

And what, after these pages of findings and qualifications, do I think we've learned? The effects of the minimum wage on employment are smaller than I would have supposed. Part of this small effect is due to the fallacy of the inflated denominator: with incomplete coverage and the fact that most workers in nearly any demographic group earn more than the minimum wage, the effect on any such group's employment will be smaller (in proportional terms) than it would be if impacts on those directly affected could be isolated. If one comes to the issue willing to suffer some efficiency loss for a real distributional gain—at least until someone isolates a lump-sum grant—than the real surprise is not the disemployment effects but the very tenuous connection of the minimum wage to poverty. It is hard for me to see evidence that minimum wage increases have benefits which would overcome an economist's aversion to interfering with reasonably competitive markets. But the case against the minimum wage seems to me to rest more upon that aversion than on the demonstrated severity of any harm done to those directly affected.

A short paper like this one must skip some issues. In a longer paper, the short literatures on whether low-wage employers reduce the training they provide in response to the minimum, on how effectively the minimum wage is enforced, on whether the minimum wage in fact has an appreciable upward ripple effect on other wages, and on who supports and opposes minimum-wage legislation—and why—would deserve more attention. But answers to those questions do not seem likely to change the basic conclusion that the minimum wage is overrated: by its critics as well as its supporters.

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July 24, 1993

SECTION: Business; ECONOMICS FOCUS; Pg. 71 (U.K. Edition Pg. 73)

LENGTH: 899 words

HEADLINE: Rich man, poor man

HIGHLIGHT:
The gap between high earners and the lowest paid has widened. Why?

BODY:
THE OECD forecasts that unemployment in its 24 member countries will rise to a record 36m (8 3/4% of the labour force) by the end of next year, up from 24.5m in 1990. Europe's jobless rate is expected to hit 12%. The challenge to policy-makers is to prevent this cyclical rise in joblessness becoming permanent. In past recoveries the cyclical increases in unemployment have not been fully reversed because of various labour-market rigidities, and so the jobless rate has ratcheted up.

Economists have long sought ways to make the labour market work better: in particular, to encourage greater wage flexibility, so unemployed workers price themselves back into jobs. Since this implies a fall in pay at the lower end of the labour market, a good sign of an efficient job market (though, possibly, a socially divisive one) is a wide gap between the highest and lowest paid. How does wage inequality vary between countries? And has the labour market been operating more flexibly in the past decade?

The OECD provides some answers in its latest Employment Outlook. The left-hand chart shows the ratio of the wages of the top 10% of earners to the bottom 10%. As might be expected, America has by far the biggest wage differentials, Sweden the smallest. The figures are not strictly comparable between countries, but they provide a broad picture of how wage differentials have moved over time.

In the 1970s wage inequalities fell or were stable in most countries, but in the 1980s the gap widened in 12 of the 17 countries studied. America and Britain saw the biggest widening in wage differentials. In America the highest-paid 10% of workers earned 5.6 times as much as the lowest-paid 10% in 1989 (the latest figure available), up from 4.8 in 1980. In Britain the ratio increased from 2.5 to 3.4 in 1991.

In most countries the wider dispersion of wages was attributable both to gains for high earners relative to median wages and to relative losses for the lower paid. The main exceptions were France and Germany where the wages of the low-paid rose relative to average earnings. In America, Australia and Canada real wages for the bottom 10% of earners fell during the 1980s. In Britain, however, the real pay of the bottom 10% has risen by 11% since 1980 -- albeit less than the 51% hike for the top 10%.

Why have wage inequalities widened in most countries? One possible explanation is the slew of labour-market reforms, such as decentralisation of

The Economist, July 24, 1993

wage bargaining, the move to performance-based pay, cuts in minimum wages and the decline in union power. The OECD reckons that such factors help to explain why America and Britain have seen the largest increase in wage inequality but cannot be solely responsible for the recent changes.

Another popular explanation for growing wage inequality, which many Americans fret about, is de-industrialisation: the replacement of "high quality" jobs in industry by "low quality" jobs in services, including the infamous hamburger-flipping "McJobs". The OECD study concludes, however, that shifts between different sorts of industry, such as between manufacturing and services, are much less influential than the changes within individual industries.

The most important causes of increased wage differentials, says the OECD, are changes in the relative demand and supply of different types of workers, by age and by education. For example, most OECD countries saw a record number of 15 to 24 year olds enter the labour force in the 1980s. This reduced the wages for young workers relative to average wages, and so increased overall dispersion.

Perhaps the most striking increase in wage differentials was between workers with a university degree and those without. In the 1970s this gap narrowed as the supply of workers with a degree increased rapidly. In the 1980s, however, the supply of college-educated workers grew more slowly and their relative rewards rose. For example, in America the number of people with university degrees increased by an annual average of 2.6% in the 1980s, down from 4.4% in the 1970s.

At the same time as the supply-growth of highly educated workers has slowed, the demand for them has accelerated. Technological innovation -- in particular, the increased use of computers -- has added to the demand for highly educated, skilled workers and reduced the demand for less skilled. Putting these two factors together, the premium earned by American university-educated workers over those who left after high school rose from 37% in the late 1970s to 53% in 1989. The OECD thus rates education as one of the most important explanations for the increase in overall wage differentials.

The more flexible a country's labour market, the more these changes in demand and supply show up in relative wages rather than unemployment. Where countries have a high minimum wage, by contrast, this sets a floor for wages for the less skilled and so prevents the market from clearing. The result: higher unemployment. In France, for instance, the minimum wage rose from 46% of median earnings in 1979 to 53% in 1987. By contrast, America's minimum wage fell from 40% to 30% of average wages over the 1980s. No wonder 23% of French under 25 years old are unemployed, almost twice as many as in America. Perhaps Bill Clinton should reconsider his plan to raise America's minimum wage.

GRAPHIC: Graphs 1 through 3, no caption

LANGUAGE: ENGLISH

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September 3, 1988

SECTION: World politics and current affairs; AMERICAN SURVEY; Pg. 22 (U.K. Edition Pg. 34)

LENGTH: 839 words

HEADLINE: Minimum wage;
An honest day's pay?

DATELINE: WASHINGTON, DC

BODY:

UNDER President Reagan, America's federal minimum wage has fallen by about a quarter in real terms. The unemployment rate has also fallen, to its lowest level for 14 years. Combine those two facts, and you have the explanation for some unexpected congressional reluctance to raise the minimum wage.

The Fair Labour Standards Act, passed just 50 years ago, was a cornerstone of the New Deal. Every few years, Congress revised and broadened its terms. But the latest revision, introduced at the end of last year by the Democratic chairmen of the Senate and House of Representatives labour committees, Mr Edward Kennedy and Mr Augustus Hawkins, is having a hard time. With the House and Senate pushing each other to be the first to debate the bill (which already has lost the clause that would index the minimum wage to half the average wage), the guess is that it has less than a 50-50 chance of getting through before Congress adjourns in October and its members head off on the campaign trail.

Time is short (especially in the Senate where unlimited debate is the rule) and the minimum-wage bill has to compete with other pieces of legislation, including antidrug measures, child-care and the textile bill, considered more important by party leaders. The low congressional priority is symptomatic of the change in national mood. Support for a higher minimum wage is no longer a Democratic litmus test. Witness the editorials in the New York Times which have been opposing the increase, arguing that there are better ways to fight poverty. It was once assumed that "economic royalists" (Franklin Roosevelt's phrase) should be compelled to pay their employees a living wage; these days, employers are seen as decent people who should be helped along to create the jobs that everybody needs.

Several hundred thousand unskilled jobs would be lost if the minimum wage were raised, argue the bill's opponents. Wrong, say its advocates, noting that a dozen or so states (the richer ones, to be sure) have already raised their minimum wages without loss of jobs. Conflicting sets of statistics are brandished in evidence. But the bill's champions -- mainly minority and women's groups -- carry little political clout compared with the broad swathe of small businesses that have been lobbying Congress hard. The trade unions shot their bolt this year on the plant-closing bill; after eight years of President Reagan they are probably no longer powerful enough to win two last-ditch battles in one year.

The Economist, September 3, 1988

One persuasive argument against supporting the bill is that a group of its opponents have come up with a more effective way of helping the working poor, or at least the ones most plainly in need. The Job Enhancement for Families bill, introduced by Representative Thomas Petri, a Republican from Wisconsin, proposes a big expansion, pegged to the number of children, of the earned-income tax credit, the tax-based federal subsidy paid to low-income working parents. The most that a parent can now be given is \$ 870 a year; Mr Petri would increase this to \$ 2,500 for a family with four or more children.

Mr Petri's bill is attracting a lot of interest, including some Democratic support. The far-right disapproves of it as undisguised social engineering but keeps quiet since the bill has clearly been useful in blocking a rise in the minimum wage. The cost of the proposal, estimated at \$ 1.5 billion in the first year, rules it out for passage this year but its backers are hoping to see it introduced early in the new administration. Its great merit is that it concentrates on people who are attempting to bring up families on low wages, distinguishing them from middle-class youngsters flipping hamburgers. Some 4.9m people earn the minimum wage or less, of whom about 1m are officially rated as poor. Rather more than one-third are teenagers, and two-thirds (including most of the teenagers) are part-time. Only a small proportion of minimum-wage earners would be affected by the Petri proposal. The childless poor would fall through the gap so it is not, in the sense, a direct substitute for the Kennedy-Hawkins bill.

Shortly before Congress went on holiday, Senator Dan Quayle, the senior Republican on the Senate's subcommittee on labour, circulated a memorandum supporting an increase in the earned-income tax-credit plus a phased increase in the minimum wage to \$ 4 but with teenagers kept a step or two behind their elders. Mr Quayle had been expected to lead the opposition to Mr Kennedy's bill on the floor of the Senate; now that he has other plans for the autumn, the job will probably go to Senator Orrin Hatch, the senior Republican on the full labour committee.

The decision will depend on timing -- and campaign tactics. American opinion may no longer equate decency with support for a higher wage but it has not, as yet, somersaulted to the point where the Bush campaign would be well-served by the sight of Mr Quayle in full view attacking a modest rise in the minimum wage.

GRAPHIC: Graph, Falling behind, Source: US Bureau of Labour Statistics

LANGUAGE: ENGLISH

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May 14, 1988

SECTION: Leaders; Pg. 15 (U.K. Edition Pg. 17)

LENGTH: 811 words

HEADLINE: The kindest cut

HIGHLIGHT:

Wage-fixing laws usually hurt the people they want to help

BODY:

EXACTLY 50 years ago a minimum wage was first introduced in America. It had a high-minded aim: to relieve poverty. The best way to celebrate its 50th anniversary would be to abolish it. Instead Congress looks set to approve a bill that would raise the minimum wage by half over the next four years -- supposedly to the benefit of the working poor. Those who succeed in hanging on to their jobs will indeed gain. Others will end up with no job at all as employers are prevented from offering jobs at wages which would otherwise be acceptable to many workers, especially young ones.

Governments that interfere in the labour market in pursuit of fairness should always think twice. All too often, their well-intentioned measures end up hurting the very workers they are designed to help. Governments can order employers to raise wage rates for certain groups of workers, but they cannot force them to hire workers at that rate. A "fair" wage suddenly looks less fair when some employees are pushed out of their jobs.

Since 1981 America's federal minimum wage has remained at \$ 3.35 an hour, allowing inflation to erode its real value. It is now more than a third lower than as its real peak in the late 1960s. During the same period the ratio of teenage jobless rates to total jobless rates has fallen from 3 1/2 to around 2 1/2. In France, by contrast, the minimum wage rose by about 15% in real terms in the first half of the 1980s; its youth unemployment rate rose faster than any other big OECD country's. On one estimate, each 10% rise in America's minimum wage would destroy 200,000 jobs.

Evidence like that should make all but the blinkered pause before asking governments to tamper with labour markets. That is true of minimum wages -- and also of legislating for equal pay for women.

The cost of equality

Although the gap has narrowed during the past decade, the average woman in America and Britain still earns only about three-quarters as much as a man. In Britain 40% of female full-time manual workers earn less and £100 a week, compared with only 6% of men. Discrimination, cry the feminists. Free-market economists argue that the gap partly reflects differences in education and training, interruptions to employment when women take time out to have children, and different career preferences. Studies suggest that such factors can explain around half of the wage gap. Is the rest due to discrimination?

The Economist, May 14, 1988

Maybe not. All agree that men and women doing the same work should get the same pay. The trouble is that men and women are rarely doing identical jobs. Some jobs are predominantly filled by women, others by men. This makes it easy for employers to pay women less, and it is difficult to spot discrimination without trying to compare the economic worth of different jobs. Such comparisons will never be much more than guesswork. Despite this, campaigns are underway in Britain and America demanding equal pay for work of comparable worth. In a recent case Britain's House of Lords ruled that a female cook at Cammell Laird shipyards should get the same pay as men whose work was deemed of equal value -- specifically, a joiner, a painter and an insulation engineer. This was promptly hailed as a "victory for working women", and will encourage similar claims (see page 59).

Most supporters of equal-pay laws deny that these can succeed only at the cost of fewer jobs. They point out that the increase in the relative pay of women since 1970 has not prevented female employment from rising more quickly than that for men. But during the past two decades the demand for labour has grown fastest in those sectors of the economy which are the biggest employers of women, particularly public and private services. Female employment might well have risen even faster if the equal-pay laws had been weaker.

The current pattern of relative wages may reflect sexual discrimination: to that extent it is inefficient as well as unfair. But judges and bureaucrats cannot be relied upon to measure economic value more accurately than the market, even though the market is in this instance flawed. And legislated increases in pay for women -- even if they are closing a true discrimination gap rather than an imagined one -- will almost always mean fewer jobs for women. That is why meddling with wages is a poor way to fight labour-market discrimination of whatever kind. A better way is to help the disadvantaged to improve their skills and thereby encourage them to shift into better-paid occupations.

Governments should also try to guarantee something the market cannot: access for all, free of race or sex discrimination, to all jobs. For 142 years British women have been barred from becoming coal miners. If they want to get dirty at the coal face, let them -- and pay them the market rate.

GRAPHIC: Graph, no caption

LANGUAGE: ENGLISH

3RD STORY of Level 1 printed in FULL format.

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May 15, 1993

SECTION: World politics and current affairs; Asia; Pg. 35 (U.K. Edition Pg. 81)

LENGTH: 968 words

HEADLINE: The price of Thailand's prosperity

BYLINE: FROM OUR SOUTH-EAST ASIA CORRESPONDENT

DATELINE: BANGKOK

BODY:

FOR the past five years, Thailand has been intoxicated by its success. In the late 1980s, the economy was growing at more than 10% a year. Even now, with the world economy slack and poorer Asian countries emerging as rivals for foreign investment, Thailand is likely to grow at 7-8% a year for the next few years.

But some Thais are wondering whether they have gone about things in the right way. The fire at the Buddha Monthon toy factory on May 10th which killed more than 200 workers was the worst factory fire in history, and will provoke gloomy introspection in a country whose unofficial slogan is mai pen rai -- never mind.

Thailand prides itself on being one of the easiest places in Asia to do business in. Some foreigners even see benefits in widespread corruption. "It makes the system more flexible," argues a Japanese businessmen. But flexibility has its price. Brothels flourish because the police are paid off. Forests get hacked down because nobody stands up to the logging industry. And toy factories with pitifully inadequate fire precautions stay open.

The present Thai government, one of the least corrupt in recent memory, is trying to make the rule of law a theme of its administration. Chuan Leekpai, the prime minister, is a lawyer by training. He insists that Thailand now intends to get serious about enforcing the law on a range of issues, from child prostitution to copyright piracy to safety in the workplace.

But changing entrenched ways of doing things and challenging powerful financial interests will be difficult, whatever the intentions of the government. Some are inclined to shrug their shoulders and say that Thailand, like an unruly adolescent, is just "going through a phase". The early stages of industrialisation are often rough. Britain's industrial revolution made ample use of child labour. Some Americans still recall the terrible fire at the Triangle shirt factory in New York in 1911 that killed 145 people. Britain and America were able to afford better laws and safer workplaces as they got richer.

Yet it is not clear that Thailand is well-placed to move on to the next stage of economic development. Despite the rapid growth of recent years, poverty is proving stubbornly hard to eradicate. A recent World Bank study of six East Asian countries concluded that Thailand was the only one that had failed to make significant in-roads into poverty during the 1980s (see table). As the bank noted, "in 1990 Thailand's incidence [of poverty] was as high as Indonesia's,

The Economist, May 15, 1993

even though its average GNP per capita was 2.5 times higher."

Poor Thailand			
Incidence of absolute			
poverty *, % of			
population			
	1970	1980	1990
Philippines	35		
30	21		
Thailand	26		
17	16		
Indonesia	60		
29	15		
China	33		
28	10		
South Korea	23		
10	5		
Malaysia	18		
9	2		

Source: World Bank

* Living at or below subsistence levels, as defined by World Bank.

World Bank officials have no pat answers for why there has been so little trickle-down in Thailand. Some people think it is because the boom has concentrated on Bangkok. Only 15% of the population of Thailand lives in the Bangkok area, which accounts for half of GDP. Income levels in Bangkok are nine times higher than in the north-eastern part of Thailand, where one-third of the population lives.

Another version blames the education system. Although Thailand has a relatively high rate of literacy and primary school enrollment, the secondary system is weak. Many Thais have no chance of turning themselves into anything but sweatshop labour. As Chalongphob Sussangkarn of Thailand's Development Research Institute points out, even if all primary-school pupils go on to secondary school from now on, "there will still be 70% of Thailand's workforce in the year 2000 who will have only primary education or less."

The plight of the rural poor does not tend to loom right in the minds of businessmen, but even they need to pay attention to Thailand's educational shortcomings. Skill shortages are already a problem. The country produces some 3,500 engineering graduates a year, only about half as many as private industry needs. Computer scientists are also in short supply.

The government talks as much about the distribution of wealth as about its creation. It is encouraging banks and factories to set up outside Bangkok, and is expected to bolster the price of rice to increase farmers' incomes. It is planning to increase the education budget by 20% -- though, with employers crying out for trained manpower, it is difficult to recruit teachers.

The government's social conscience inevitably raises questions about the balance between growth and welfare. The minimum wage, for instance, increased by 50% in 1989-92, thus raising the cost of doing business in Thailand. Some critics link this with the sharp drop in foreign investment last year, though foreigners may also have been put off by the army's killing of civilian

The Economist, May 15, 1993

demonstrators in Bangkok last May.

A slowdown in investment may not hit growth for a while. Many of the factories started in the late 1980s are only just beginning to produce. Exports are still growing fast. The government has a list of long-promised infrastructure projects that could make up for the fall in private investment, though a bitter dispute in progress between the government and foreign banks that have lent 20 billion baht (\$ 787m) for an elevated motorway in Bangkok may make finance for future projects harder to come by.

In the longer run, if Thailand is to sustain its growth rate it will need to create more jobs in higher-value-added industries. The departure of sweatshops to China, Vietnam or Indonesia will be good news for Thailand only if better jobs replace them.

GRAPHIC: Picture, Victim of the toy-factory fire; Graph, no caption

LANGUAGE: ENGLISH

Minimum pay in 18 countries

In this survey we look at the different systems of determining minimum pay in western Europe and the mechanisms for its revision, and assess current trends and developments. We also review the international labour standards relating to minimum pay and provide a historical perspective of statutory wage minima.

International wage standards

The necessity of ensuring that all workers receive an adequate living wage and a decent standard of living for their families has been recognised by international bodies such as the International Labour Organisation (ILO), the United Nations (UN), the Council of Europe and the European Communities (EC).

At its 1944 conference the ILO issued the Declaration of Philadelphia which states that: "the Conference recognises the solemn obligation of the International Labour Organisation to further among the nations of the world programmes which will achieve . . . a minimum living wage [for] all employed and in need of such protection." The ILO has also adopted several Conventions concerning minimum wage issues (Conventions are legally binding on those countries which ratify them).

The Convention concerning the Creation of Minimum Wage-Fixing Machinery (No. 26) of 1928 has as its objective that ratifying states "undertake to create or maintain machinery whereby minimum rates of pay can be fixed for workers employed in certain of the trades or parts of trades (and in particular of homeworking trades) in which no arrangements exist for the effective regulation of wages by collective agreement or otherwise and wages are exceptionally low."

Though the Convention does not specify the level at which minimum wages should be set, Recommendation No. 30 of 1928 – intended as a guide to Convention No. 26 – says that "regard should primarily be had to the rates of wages being paid for similar work for trades where the workers are adequately organised and have concluded effective

collective agreements."

Convention No. 99 of 1951 sought to fill the gap left by the earlier Convention as regards agriculture, and covers the establishment of minimum wages in that sector. Both Conventions 26 and 99 require that employers and workers concerned shall take part in the operation of the minimum wage-fixing machinery, which implies that they must at least be consulted as to the amount of the minimum wages fixed". They also require that: minimum wages shall have the force of law and not be subject to abatement; and that there be provision for sanction and supervision to ensure employers and workers are informed of the minimum wage rates in force and that wages are not paid at less than these rates.

Convention No. 131 of 1970, which has special reference to developing countries, states that ratifying countries undertake "to establish a system of minimum wages which covers all wage earners whose terms of employment are such that coverage would be appropriate." The accompanying Recommendation No. 135 says that the numbers of workers not covered in pursuance of this objective should be kept to a minimum.

Convention No. 131 sets out that the criteria to be taken into consideration in determining the level of minimum wages should include: the needs of workers and their families (taking into account the general level of wages in the country, the cost of living, social security benefits, and the relative living standard of

other social groups); and economic factors, including the requirements of economic development, levels of productivity and the desirability of attaining and maintaining a high level of employment.

It is important to emphasise that ILO Conventions do not oblige ratifying states to create or maintain minimum wage-fixing machinery, if wages may be effectively fixed by collective agreement. This is clearly stated in Convention No. 26 (Article 1), while Convention No. 99 is so worded as to permit its implementation through minimum wages set by collective agreement. Collective bargaining, moreover, is explicitly recognised as a valid form of minimum wage-fixing by Recommendation No. 135, and implicitly by Convention No. 131[†].

As of 25 March 1992, Convention No. 26 has received 98 ratifications (from countries including Austria, Belgium, France, Germany, Italy, Portugal, Spain and Switzerland), Convention No. 99 has been ratified by 49 countries and No. 131 has been ratified by 34 states. None of these Conventions is currently ratified by the United Kingdom (Convention No. 26 was originally ratified by the United Kingdom, but was denounced in 1985). 3!

The United Nations has also addressed the question of minimum wages. Its Universal Declaration of Human Rights provides that "everyone who works has the right to just and favourable remuneration ensuring for himself and his family an existence worthy of human dignity" (Article 23). Moreover, the UN's International Covenant on Economic, Social and Cultural Rights requires governments which have ratified it to make provision for the right to "remuneration which provides all workers, as a minimum . . . with a decent living for themselves and their families" (Article 7).

European wage standards

Provision for fair wages is also made in the European Social Charter, an international treaty concluded under the supervision of the Council of Europe in 1961. The European Social Charter calls on states which have ratified it (the United

* Starr G and Swepton L (1990) "Remuneration and International Labour Standards, in Blanpain R (ed), "Flexibility and wages – a comparative treatment", Bulletin of Comparative Labour Relations, special issue, Kluwer.

† International Labour Conference (1992), "Minimum wages – wage-fixing machinery, application and supervision", ILO, Geneva.

Kingdom is among the many countries which have done so) to ensure "the effective exercise of the right to a fair remuneration", and recognise "the right of workers to a remuneration such as will give them and their families a decent standard of living" (Article 4).

The Council of Europe's Committee of Independent Experts has proposed a formula for a "decency threshold" for pay, which should correspond to a level which is approximately 68% of the national average wage, a figure which might be modified when other social benefits are taken into account, such as subsidies, tax benefits or other social security benefits.

The European Social Charter should not be confused with the European Community's Charter of the Fundamental Social Rights of Workers. This "Social Charter" was adopted by 11 of the 12 Member States at the Strasbourg Summit of 8 December 1989. Under the heading "Employment and remuneration" the Charter states, in Point 5, that "all employment shall be fairly remunerated" and that, in accordance with arrangements applying in each country, workers shall be assured of an equitable wage, sufficient to enable them to have a decent standard of living.

The Charter itself does not, of course, have any binding force, being merely a solemn declaration of intent. In order for any legal rights to arise from its provisions it must be translated into Community legislation and this was the aim of the Action Programme which was published by the Commission on 27 November 1989. The Programme does not, however, propose any binding legislation in relation to minimum pay, and merely proposes a Commission Opinion, which has no legal force. "It is not the task of the Community," states the Commission, "to fix a decent reference wage. This concept corresponds to different criteria from one country of the Community to another and should be defined at the level of the Member States." (See box on p.20 for details of the Opinion.)

National minimum wage systems

Out of the 18 countries covered in this survey, a total of eight have national

Statutory minimum wages – a historical perspective

Statutory minimum wage regulation is generally regarded as having originated in Australia and New Zealand at the turn of the century as an attempt to prevent and settle industrial disputes. In 1894 New Zealand adopted the Industrial Conciliation and Arbitration Act. This provided for the referral of disputes to arbitration courts, in the event that conciliation machinery had previously failed to resolve them, and when such referral was requested by a registered union. Arbitration was general and compulsory insofar as all employers were compelled to appear, brought before the court on application of the union concerned. The system was subsequently adopted by the state of New South Wales in 1901, while in 1904 the Commonwealth Conciliation and Arbitration Act was passed, which provided for federal arbitration machinery to prevent and settle disputes extending beyond the boundaries of a single Australian state. The introduction of this award system was resisted by employers who saw it as a means of strengthening unionism and forcing up wages.

The state of Victoria established a system of fixing minimum pay by wages boards in 1896. This was examined by the British parliament which introduced trades boards – the forerunners of the present day wages councils – in 1909 to protect workers in poorly organised sectors against the evils of "sweating".

Minimum wage law in continental Europe at this time was mainly confined to the protection of homeworkers. Legislation of this kind was passed in Germany in 1911, while in France a legal minimum wage was set for homeworkers in the textiles industry in 1915. A minimum wage to cover homeworkers was also introduced in Belgium in 1934.

In the USA, 18 states had passed minimum wage laws protecting vulnerable categories of employee (such as women and minors) by 1923, and in 1938 the Federal Labor Standards Act introduced a national minimum wage for all workers employed in interstate or foreign commerce. By 1920, seven of Canada's nine provinces had passed minimum wage laws applicable mainly to women, while Mexico passed laws in 1937 establishing wage minima applicable to all workers.

In Europe, national minimum wage systems emerged mainly in the post-war period. Luxembourg saw the introduction of a national minimum wage system as early as 1944, while France instituted a national minimum guaranteed wage in 1950. In Malta provision for a statutory minimum wage was made in 1954, and legislation for national minimum systems was subsequently introduced in Spain (1963), the Netherlands (1969) and in post-revolutionary Portugal (1974).

* Brown H R (1986), "The origins of trade union power", Oxford University Press, Oxford.
* McMahon G (1990), "Low pay, the minimum wage and the European Social Charter: international practice and experience", Dublin Institute of Technology.

minimum wage systems, these being Belgium, France, Greece, Luxembourg, Malta, Netherlands, Portugal and Spain. Six of these countries have statutory minimum wage systems while in Belgium and Greece the minimum wage is determined by legally binding central agreements.

It should be emphasised, however, that in all countries with national minimum wage systems, most employees are not in fact directly affected by statutory or centrally agreed minima. Instead, minima for the majority of workers are determined by collective agreement. In Belgium and France, for example, the national minimum wage acts as an absolute floor which is supplemented by

legally-binding sectoral rates which result from collective bargaining. In Belgium only around 4% of the total workforce in the private sector are not covered by sectoral provisions and are thus subject to the national minima, while in France the statutory national minimum wage only applies to around 9% of the workforce.

Similarly, the national minimum wage only applies in the absence of regulation by collective agreements in Luxembourg and Malta, where they are usually concluded at company level, and in Greece, Portugal and Spain, where bargaining structures are more fragmented, with negotiations being conducted at several different levels.

Reviews

Most countries with a statutory system of minimum wage determination provide for a review of minimum wage levels at regular intervals. Reviews are held annually in France, Malta, Spain and Portugal and at two-year intervals in Luxembourg, while in the Netherlands reviews have traditionally been held every three years.

The reviews of statutory minima are typically determined in the light of the general economic situation and/or specific criteria of economic performance. The review process generally provides for consultation with the "social partners".

Thus in *France*, for example, the Government must consider the "reasoned" opinion of the National Commission for Collective Bargaining, in *Portugal* the Government must consult the Standing Committee for Social Consultation and in the *Netherlands* the Government is legally obliged to consult the tripartite Social Economic Council (SER) to give an opinion on the minimum wage review.

In *Luxembourg* there is no formal requirement for consultation with the "social partners", though the Government has to submit its proposal for a minimum wage review for consideration by Parliament.

Interim Adjustments

Most countries have mechanisms for the interim adjustment of wage minima between regular reviews. These are generally based on developments in consumer price indices. *Spain* has provision for updates at six-monthly intervals, while in *Belgium*, *France*, and *Luxembourg* minimum wage rates are adjusted automatically through a set formula based on the cost of living.

In *France*, for example, an increase of 2% in the consumer price triggers an equal rise in the minimum wage, while in *Belgium* the minimum wage is adjusted on the basis of the average of the consumer price index for the last four months.

Malta and *Portugal* have no provision for interim adjustments to the national minimum wage.

Categories of workers

In all eight countries with a national minimum wage there are special arrangements governing the minima payable to young workers. In five countries the full rate applies from the age of 18, though in *Belgium* and the *Netherlands* workers receive the full minima from the ages of 21 and 23 respectively, while in *Greece* the national minimum applies from the age of 18 for blue-collar workers and 19 for white-collar workers.

Young workers typically receive a fixed percentage of the adult minimum, with the exception of *Malta* and *Spain*, where the youth minima are fixed as set amounts. In most countries with a national minimum wage the rates of young workers are scaled down according to their ages, though in *Spain* and *Portugal* young employees of legal working age receive the same minima regardless of age.

In all eight countries the minimum rate is applied pro-rata to part-time workers. In the *Netherlands*, however, part-time workers must work at least one third of standard hours to be eligible for minimum wage rates.

Workers with disabilities are generally paid full national minimum wage rates. However, in *France*, *Luxembourg* and *Portugal* workers whose ability to work is impaired may have their minimum wage reduced, though in the case of *Luxembourg* authorisation for such a reduction is granted for a limited period only.

In *Portugal* separate minima are determined for workers in industry and services, agriculture, and domestic service (at present the minima for the first two sectors are identical). This is in contrast to the position in the other seven European countries, where a uniform standard minimum wage applies throughout all sectors of the economy.

Luxembourg is the only country in which the national minimum wage varies according to skill levels – the current rate for skilled workers is 22% above that which applies to the unskilled. The Grand-Duchy also provides for different minima in accordance with family status. Thus unskilled workers with family

responsibilities currently receive an extra 3% on the standard minimum, while in the case of skilled workers, the present supplement is 1.2%.

In the other 10 countries covered by this survey there are no national minimum wage systems. In the majority of them the determination of minimum wages is left almost entirely to collective bargaining. Three countries, however – *Cyprus*, the *United Kingdom* and *Ireland* – are characterised by selective systems of statutory minimum pay, with wage minima mainly determined by collective bargaining, though in specific industries and trades, pay is determined by statutory wage-fixing machinery.

Collective bargaining

Austria, *Denmark*, *Finland*, *Germany*, *Italy* and *Sweden* all set minimum rates of pay across all sectors of the economy through legally binding industry-level collective agreements. These minima correspond to the rates for the lowest pay groups of a collective agreement and are negotiated in the same way as wage and salary rates for other pay groups within a sector. In *Switzerland* sectoral agreements (at national or lower level) set minimum levels throughout most of the private sector, except in metalworking and watchmaking where pay is determined at company level.

Pay agreements are usually renegotiated annually in *Austria*, *Germany*, and *Sweden*; every two years in *Denmark* and *Finland*; and every three to four years in *Italy*, while in *Switzerland* the intervals at which agreements are renegotiated vary from three to five years. Provision for interim index-linked updating of pay exists in *Finland* and *Switzerland*, though in *Italy* the famous *scala mobile* system of pay indexation has recently been abolished (EIRR 223 p.10).

Coverage

Collective agreements in these countries are effective mechanisms of minimum wage determination insofar as they cover a very high proportion of the workforce. In *Finland*, for example, agreements cover 85%–90% of the workforce and in *Austria* the proportion is as high as 98%. In *Germany*, *Finland*

Minimum pay in 18 countries				
	System	Wage setting and adjustment	Scope	Current levels
Austria	Legally binding industry-level agreements (<i>Kollektivverträge</i>).	Agreements are usually renegotiated every 12-14 months.	Around 98% of the workforce are covered by agreements.	● <i>Textiles</i> – 10,000 S (approx. £566) per month. ● <i>Metalworking</i> – 11,506 S (approx. £651) per month. ● <i>Banking</i> – 11,417 S (approx. £646) per month.
Belgium	The national minimum wage (<i>Revenu minimum mensuel moyen garanti – RMMM</i>) is determined by legally binding central agreement.	Minimum wage is normally renegotiated every two years and automatically adjusted to reflect the cost of living.	Applies in the absence of regulation by industry- or company-level agreements – an estimated 4% are therefore directly affected.	● 39,257 F (approx. £759) per month for all workers over 21. ● 40,340 F (approx. £779) per month for all workers over 21.5 with six months' service.
Cyprus	Non-legally binding sectoral collective agreements, and selective statutory wage minima.	Agreements are usually renegotiated every two (sometimes three) years. Index-linked adjustments every six months.	Around 85% of the workforce are covered by collective agreements while around 5% are subject to statutory minima.	● <i>Clothing</i> – Cy£43 (approx. £58.80) per week. ● <i>Metalworking</i> – Cy£69 (approx. £89.60) per week. ● <i>Banking</i> – Cy£294 (approx. £381.70) per month (clerks). ● <i>Statutory minimum wage</i> – £Cy166 per month (approx. £215.50).
Denmark	Legally binding sector-level collective agreements	Agreements normally renegotiated every two years.	Collective agreements cover an estimated 80%–85% of all workers.	● <i>Textiles</i> – 65 kr (approx. £6.70) per hour. ● <i>Metalworking</i> – 66 kr (approx. £6.80) per hour. ● <i>Banking</i> – 170,400 kr (approx. £17,570) a year.
Finland	Legally binding sectoral agreements.	Usually updated every two years.	Agreements cover around 85% to 90% of the workforce.	● <i>Textiles</i> – 26.43 mk (approx. £3.32) per hour. ● <i>Metalworking</i> – 27.12 mk (approx. £3.41) per hour. ● <i>Banking</i> – 5,380 kr (approx. £677) per month.
France	Statutory minimum wage (<i>Salaire minimum inter-professionnelle de croissance or SMIC</i>).	Fixed annually by decree following consultation with National Commission for Collective Bargaining, and adjusted automatically in line with real price increases.	Around 9% of the workforce are covered by the SMIC wage rates.	5,756.14 F (approx. £680) per month.
Germany	Legally binding sectoral agreements (<i>Tarifverträge</i>).	Pay agreements are usually renegotiated annually.	Agreements cover around 90% of the workforce.	● <i>Textiles</i> – 2,124 DM (approx. £846) per month. ● <i>Metalworking</i> – 2,108 DM (approx. £840) per month. ● <i>Banking</i> – 2,369 DM (approx. £944) per month.

System	Wage setting and adjustment	Scope	Current levels
Greece	National minimum wage is determined by legally binding central agreement.	The central pay agreement is usually updated every year (though the current accord has a two-year duration). <i>7-10 350</i>	Most lower-level agreements improve on the national minimum. ● 78,000 dr (approx. £242) per month for white-collar workers. ● 3,500 dr per hour (approx. £10.90) for blue-collar workers.
Ireland	No national minimum wage but there are statutory minima for 15 specific sectors.	Joint Labour Councils (JLCs) propose wage minima to the Labour Court, which issues Employment Regulation Orders setting binding minima, which are subject to an ongoing review.	An estimated 150,000 workers – around 12% of the total labour force – are covered by JLCs. ● Contract cleaning – £11.42 per hour. ● Waiters/waitresses – £117.43 per week. ● Aerated waters and wholesale bottling – £139.43 per week.
Italy	Legally binding industry-level agreements.	Wage rates are renegotiated every three to four years, and till recently were adjusted by the <i>scala mobile</i> pay indexation system.	Collective agreements cover the vast majority of workers. ● State sector metalworking – 473,000 Lit (approx. £224 per month). ● Textiles – 467,000 Lit (approx. £221) per month. ● Banking and finance – 704,966 Lit (approx. £334) per month for cleaners and 1,573,662 Lit (approx. £745) for managers.
Luxembourg	Statutory national minimum wage (<i>Salaire sociale minimum</i>).	The minimum wage is fixed by law every two years. Interim adjustments are made for cost-of-living trends.	In 1989 10.7% of the workforce were on the national minimum wage. ● Unskilled workers – 37,739 F (approx. £729) per month. ● Skilled workers – 45,287 F (approx. £874) per month.
Malta	Statutory national minimum wage (<i>National Standard Order</i>).	Minimum wage is determined and updated by the tripartite Labour Board.	No reliable statistical evidence available. LM35.63 (approx. £65.30) per week.
Netherlands	Statutory national minimum wage (<i>Minimumloon</i>).	The Government periodically reviews minimum wages and may grant special increases for "social reasons".	Some 5% of the workforce draw a wage around the national minimum. 2,163.2 g (approx. £766) per month.
Portugal	Statutory national minimum wage (<i>Remuneração mínima mensal garantida – RMMG</i>).	Minimum wage is determined annually by decree-law on the basis of inflation and productivity indices, and following consultations with the "social partners".	An estimated 8% of the industrial workforce are directly affected by minimum wage provisions. ● 38,000 esc (approx. £171) per month for domestic service sector. ● 44,500 esc (approx. £200) per month for all other sectors.
Spain	Statutory national minimum wage (<i>Salario Mínimo Interprofesional – SMI</i>).	The level of the minimum wage is established annually by decree-law (based on indices of price, productivity etc). Six-monthly adjustments in light of inflation increases.	The minimum wage affects an estimated 1.5 million workers or 10% of the total labour force. 55,280 ptas (approx. £313) per month.

	System	Wage setting and adjustment	Scope	Current levels
Sweden	Legally binding industry-level collective agreements.	Agreements are generally negotiated on an annual (sometime biennial) basis.	Collective agreements cover nearly all workplaces in Sweden.	● <i>Textiles</i> – 57.55 kr (approx. £6.10) per hour. ● <i>Metalworking</i> – 56.62 kr (approx. £6.00) per hour.
Switzerland	Industry-level collective agreements (<i>Gesamtarbeitsverträge</i> or GAVs).	Agreements are generally negotiated for a period of three to five years. Updating for cost of living every autumn either by negotiation or by automatic clauses.	GAVs cover an estimated 1.4 million workers or 50% of all private sector employees. In the public sector some 350,000 employees have legally determined pay.	● <i>Textiles</i> – 2,500 F (approx. £1,136) per month. ● <i>Banking</i> – 2,590 F (approx. £1,177) per month, 13 times per year. ● <i>Retail</i> – 2,500 F (approx. £1,136) per month. ● <i>Cement</i> – 3,466 F (approx. £1,575) per month.
United Kingdom	No national minimum wage. Statutory minima are restricted to 26 sectors covered by wages councils.	Wages councils adjust minima annually by wages order.	Wages councils cover some 2.3 million workers or 10% of the total labour force.	Average minimum weekly rate for a 39-hour week currently stands at £109.21.

and *Switzerland* mechanisms exist for the extension of collective agreements to all companies within a sector, even if they are not members of the employers' organisation which concluded the agreement. In *Switzerland*, for instance, the state authorities (at federal and cantonal level) may extend a collective agreement to make it legally binding on all non-signatory employers and employees in the area of application, by issuing a "declaration of general applicability".

As a precondition for such an extension, however, the agreement must cover at least 50% of the workers and employers in the area concerned. At present 340,000 workers (10% of the total) are subject to extended agreements.

In other countries the comprehensive coverage of agreements is guaranteed by different means. In *Austria*, for example, statutory Chambers conclude collective agreements on employers' behalf and all employers in a particular sector are bound by an agreement, as they are all obliged to be members of a Chamber. In *Italy* case law has established that minimum wage rates determined by collected agreement must be applied by employers in an industry which are not members of the signatory employers' organisation.

Ancillary mechanisms

Certain countries have additional mechanisms of minimum wage determination covering groups of workers not subject to collective agreements.

Thus in *Austria* minimum wages may in the absence of agreement be fixed by the Federal Conciliation Office. This instrument is used for categories of employee such as domestic service workers, private teachers and nursery school teachers. In *Germany* it is possible for the labour court to rule that certain wage rates are in "violation of moral standards", while in *Italy* the Civil Code invests the judiciary with authority to determine minimum wages for workers not covered by collective agreements.

In *Switzerland* legislation stipulates that the Cantons must impose minimum wage rates for seasonal workers and daily commuters from abroad as a prerequisite for their obtaining a quota of such workers. These minima must be the same as those normally paid to Swiss workers in the area or occupation in question.

Selective systems

In *Cyprus*, *Ireland* and the *United Kingdom* statutory minimum wages are set only for certain sectors and industries

where unions and collective bargaining are traditionally weak.

In *Great Britain* this is done through the wages councils (a similar system operates in *Northern Ireland*). These are independent tripartite bodies, made up of equal numbers of employer and union representatives together with independent members. The orders of wages councils have the force of law. There are currently 26 wages councils covering around 2.3 million workers, the vast majority of whom are employed in retailing, miscellaneous services (especially hairdressing) and clothing. Since the Wages Act of 1986 minimum rates set by wages councils only apply to workers aged 21 and over. Wage orders are normally reviewed on an annual basis.

The Irish system is broadly similar. There are 15 Joint Labour Committee (JLCs) in *Ireland* which cover about 150,000 workers. The largest covers the retail, grocery and allied trades. The function of the JLCs is to submit to the Labour Court proposals for fixing minimum pay and conditions in the sectors concerned. When the Labour Court confirms these proposals it issues a legally binding Employment Regulation Order (ERO). Some EROs make distinctions on the

basis of age – the ERO for the hotel industry, for instance, distinguishes between workers under 18 years of age, workers aged 18–19, workers aged 19–20 and workers aged 20 years and over. EROs are subject to ongoing review, though a JLC cannot submit proposals amending an ERO until the Order has been in force for at least six months.

In *Cyprus* the Minimum Wage Law of 1941, enacted when the country was a British colony, authorises the Ministry of Labour to determine minimum wage levels for any occupation, if it is convinced that the wages applying to that category of employee are unacceptably low. The latest order covers four groups of workers, these being shop assistants, clerks, assistant nurses and nursery assistants. The minimum in all these sectors is the same (Cy£166 per month, rising to Cy£180 after six months). While other sectors are not legally bound by this minimum, in practice this is accepted as a wage floor throughout the entire economy. No stipulations on age are specified in either the Minimum Wage Law or the orders issued under its provisions.

The selective statutory minima apply to around 5% of the labour force in *Cyprus* and around 10% in *Great Britain and Ireland*. For the majority of workers in all three countries pay is determined by collective bargaining. Collective agreements are concluded primarily at sectoral level in *Cyprus* and cover some 85% of the workforce. In *Ireland* and *Great Britain* bargaining takes place primarily at company level (in *Ireland* bargaining is currently constrained by the tripartite national Programme for Economic and Social Progress, setting limits on pay increases until 1993 – EIRR 207 p.16). In *Great Britain* the proportion of workers whose pay is determined at least partly by collective bargaining in 1990 has recently been estimated at only 54%, down from 71% in 1984**, while in the case of *Ireland*, corresponding statistical evidence is not available.

Trends and developments

The issue of a national minimum wage attracted considerable attention and con-

** Millward N, Stevens M, Smart D, Hawes W R (1992), "Workplace industrial relations in transition – the ED/ESRC/PSI/ACAS surveys", Dartmouth.

Draft Commission Opinion on an equitable wage

The Commission of the European Communities published a draft Opinion on an equitable wage on 12 December 1991. In the accompanying explanatory memorandum the Commission says that it considers it appropriate to "outline certain basic principles on equitable wages, while taking into account social and economic realities". These principles for Community action are outlined in the text as follows:

- to look for appropriate levels of equitable wages;
- to promote the objective of high quality, high-productivity employment;
- to place particular emphasis on increased investment in education and training;
- to encourage an assessment of attitudes to traditionally low-paid groups and the strengthening of measures to combat discrimination.

The Commission considers that these principles can best be served by implementation of the following measures:

- improving transparency of the labour market, by better collection and dissemination of comparable statistical information about wage structures and reference wages at national, regional and sectoral levels, to enable more effective policies to be developed and thus remove some of the causes of unfairness;
- the protection of particularly vulnerable categories of workers on the labour market by a combination of means, including legislation, administrative arrangements and collective bargaining;
- ensuring the enforcement of agreed equitable wages, including in periods of leave or sickness;
- increasing the productivity "earnings potential" of the workforce by investment in human resource development at all levels.

The draft Opinion was endorsed by the Economic and Social Committee, which commented that the continued existence of large low-paid areas would hinder harmonious progress towards integration, seriously damage economic and social cohesion, and could undermine the cohesion of the Community economy as a whole. It also called on the Commission to support the development of "social dialogue" at EC level to encompass definition of the criteria to be borne in mind when fixing a fair wage. These criteria, it suggested, should then be taken into consideration in national wage negotiations and could possibly be enshrined, where relevant, in national legislation.

Following the ESC's Opinion, the draft Opinion currently awaits adoption by the Commission in its final form.

controversy in the run-up to the *British* general election in April this year. The opposition Labour Party promised that if elected it would introduce a legally enforceable statutory minimum wage of £3.40 an hour. However, both the Conservative Government and the Liberal Democrats remained opposed to the idea of a statutory minimum wage, which they claimed would introduce rigidities into the labour market and destroy jobs.

In neighbouring *Ireland* the question of a statutory minimum wage was one of the issues discussed in the negotiations on the Programme for Economic and Social Progress. The Programme provides that the Employer Labour Conference (a joint forum comprising union and employer representatives, including the Government as an employer, with an independent chair) will consider all the

issues relating to a statutory minimum wage, including the operation of the JLCs. The present Government, however, has indicated repeatedly that it has no plans to introduce a statutory minimum wage.

In *Austria* the ÖGB union confederation has called for a national minimum wage to be fixed either by central accord or, in the event of failure to reach such an agreement, by the introduction of a statutory minimum wage. The Government, has emphasised, however, that it is opposed on principle to any form of statutory wage determination.

The introduction of a statutory minimum wage also forms the object of debate in the context of the current restructuring of collective bargaining in *Italy*.

In other countries the debate centres

on changes to the established bargaining-based systems of wage determination. In *Germany*, for example, circles within the *Mittelstand* of small and medium-sized employers have expressed increasing resentment at the "excessive" pay increases negotiated within the existing industry-wide bargaining system, and have called for more decentralised structures (EIRR 221 p.12). The Government, moreover, has announced plans to introduce new legislation applicable to east Germany which would allow management and works councils in companies threatened with closure to negotiate pay rates lower than the minima laid down in sectoral agreements (EIRR 222 p.8).

In *Sweden* the engineering employers' federation, VI, is firmly committed to decentralising collective bargaining from sectoral to company level. They have nonetheless proposed a continuation of a negotiated minimum wage for the industry as a whole.

Unions in *Switzerland* have called for "declarations of general applicability" to be made more comprehensive in their coverage, though in *Finland* employers have attacked the "rigidities" associated with the system of extending collective agreements and have intensified their efforts for its abolition.

In countries with existing national minimum wages systems, their continuation is not seriously called into question, though changes and proposals for change continue to be made.

In *Spain*, for example, the debate centres on *how* the minimum wage should be determined (eg, by consultation or genuine negotiation) and on which criteria it should be based. The unions have called for the application of the formula suggested under the European Social Charter, ie a minimum wage equivalent to 68% of the average wage. A new frame of reference for calculating minimum wages is likewise the subject of discussion in *Luxembourg*, while in the adjacent *Netherlands* the mechanism for automatically adjusting minimum wages in line with pay rises in the public sector – the *koppeling* – was abolished in 1991.

Minimum wage rates for young work-

Minimum wages – the employment effect

Much of the debate on minimum wage regulation centres on the effects on employment levels. Opponents of minimum wage regulation argue that minimum wages distort the smooth functioning of the labour market. Labour costs are raised to an excessive degree and thus lead to job losses in the lowest-paying industrial sectors.

Research in this area is inconclusive. US economists have carried out a great deal of work on the impact of the federal minimum wage. According to a comparative study of minimum wages carried out by the UK Institute of Personnel Management, the weight of the US evidence suggests that the minimum wage reduces employment, and there have been calls for differential rates for young people.

The authors of a recent OECD study¹ on the French system of minimum wages – the SMIC – conceded that they were unable to establish satisfactorily that increases in the real value of the minimum wage have had a negative impact on youth employment, although they suspected that they have. However, the 1991 OECD annual review of the French economy was more critical. It suggested that the SMIC was partly responsible for France's high unemployment level, particularly amongst young people and the unskilled.

In the United Kingdom there have been several studies by independent researchers which have attempted to estimate the impact on employment of introducing a minimum wage, and a bewildering array of statistics have been produced. Although no conclusive evidence exists, the weight of the research would – according to the aforementioned IPM study – appear to suggest that the impact of a minimum wage on employment would be far more limited than the Government's estimates have suggested and probably lead to the loss of less than 100,000 jobs.

¹Minimum wage – an analysis of the issues, Institute of Personnel Management, 1991.

²Bazen S, Martin J (1991). The impact of the minimum wage on earnings and employment in France, OECD Economic Studies, Spring 1991.

ers have surfaced as an issue in some countries. In the *United Kingdom*, legislation passed in 1986 removed young workers below the age of 21 from the coverage of wages councils. *Belgium* has seen the introduction of a two-tier minimum wage – one for those workers who have reached the age of 21, and one for those of 21.5 years of age and over with at least six months' service – as a result of demands from employers in the framework of the 1989–90 central agreement. The employers claimed that an immediate move to the full adult rate at the age of 21 would inhibit the employment prospects of young and less-skilled workers.

The debate in *Denmark* centres round the wages received by young people between the ages of 18 and 24. Some employers' associations and politicians have maintained that much of the unemployment among young people can be attributed to the fact that young workers below the age of 18 can be employed at well below the adult minimum wage rates, but when they reach the age of 18 they are laid off. The solution, they suggest, would be to install an "introductory minimum wage" applica-

ble to workers between the ages of 18 and 24.

Over the coming months, EIRR will contain a series of brief articles describing in greater detail the minimum pay setting systems of each of the 18 countries in our survey. □

~~11:22~~
Friday
11:00

UN Taro
Ctr
~~289.8670~~ to
Sylvia
Int'l Lab
653-7653

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT—OECD

Address: 2 rue André-Pascal, 75775 Paris Cedex 16, France.

Telephone: (1) 45-24-82-00; **telex:** 620160; **fax:** (1) 45-24-85-00.

OECD was founded in 1961, replacing the Organisation for European Economic Co-operation (OEEC) which had been set up in 1948 in connection with the Marshall Plan. It constitutes a forum where representatives of the governments of the industrialized democracies discuss and attempt to co-ordinate their economic and social policies.

MEMBERS

<i>Embassies</i>	Australia	Greece	Norway
	Austria	Iceland	Portugal
	Belgium	Ireland	Spain
	Canada	Italy	Sweden
	Denmark	Japan	Switzerland
	Finland	Luxembourg	Turkey
	France	Netherlands	United Kingdom
	Germany	New Zealand	USA

The Commission of the European Communities also takes part in OECD's work.

Organization

(October 1992)

COUNCIL

The governing body of OECD is the Council on which each member country is represented. The Council meets from time to time (usually once a year) at the level of government ministers, and regularly at official level, when it comprises the heads of Permanent Delegations to OECD (diplomatic missions headed by ambassadors). It is responsible for all questions of general policy and may establish subsidiary bodies as required to achieve the aims of the Organisation. Decisions and recommendations of the Council are adopted by mutual agreement of all its members. The Chairman of the Council at ministerial level is a member of government from the country elected to the chairmanship for that year. The Chairman of the Council at official level is the Secretary-General.

Heads of Permanent Delegations (with ambassadorial rank):

Australia: DAVID BORTHWICK
Austria: GEORG LENNKH
Belgium: THEO LANSLOOT
Canada: ANNE MARIE DOYLE
Denmark: TORBEN MAILAND CHRISTENSEN
Finland: PASI RUTANEN
France: JACQUES-ALAIN DE SÉDOUY
Germany: KLAUS MEYER
Greece: DIMITRIOS GERMIDIS
Iceland: ALBERT GUDMUNDSSON
Ireland: JOHN CAMPBELL
Italy: LUIGI FONTANA GIUSTI
Japan: YOSHIYASU SATO
Luxembourg: PAUL MERTZ
Netherlands: FERDINAND VAN DAM
New Zealand: CHRISTOPHER DAVID BEEBY
Norway: BJØRN BARTH
Portugal: FERNANDO DOS SANTOS MARTINS
Spain: ELOY YBÁÑEZ
Sweden: STAFFAN SOHLMAN
Switzerland: ERIC ROETHLISBERGER
Turkey: TEMEL İSKIT
United Kingdom: KEITH G. MACINNES
USA: ALAN P. LARSON

Participant with Special Status:

Commission of the European Communities: RAYMOND PHAN VAN PHI

EXECUTIVE COMMITTEE

Each year the Council designates 14 of its members to form the Executive Committee which prepares the work of the Council. It is also called upon to carry out specific tasks where necessary. Apart from its regular meetings, the Committee meets occasionally in special sessions attended by senior government officials.

SECRETARIAT

The Council, the committees and other bodies in OECD are assisted by an independent international secretariat headed by the Secretary-General.

Secretary-General: JEAN-CLAUDE PAYE (France).

Deputy Secretaries-General: R. A. CORNELL (USA), PIERRE VINDE (Sweden), MAKOTO TANIGUCHI (Japan).

AUTONOMOUS AND SEMI-AUTONOMOUS BODIES

Centre for Co-operation with European Economies in Transition—CCEET.

Centre for Educational Research and Innovation—CERI: includes all member countries. Dir THOMAS J. ALEXANDER (see also under Education, Employment, Labour and Social Affairs, below).

Development Centre: f. 1962; includes all member countries except New Zealand. Pres. LOUIS EMMERIJ (see also under Development Co-operation, below).

International Energy Agency (see p. 176).

Nuclear Energy Agency (see p. 177).

Activities

The greater part of the work of OECD, which covers all aspects of economic and social policy, is prepared and carried out in about 200 specialized bodies (Committees, Working Parties, etc.); all members are normally represented on these bodies, except on those of a restricted nature. Participants are usually civil servants coming either from the capitals of member states or from the Permanent Delegations to OECD. The main bodies are:

Economic Policy Committee
Economic and Development Review Committee
Environment Policy Committee
Group on Urban Affairs
Development Assistance Committee
Public Management Committee
Trade Committee
Payments Committee
Committee on Capital Movements and Invisible Transactions
Committee on International Investment and Multinational Enterprises
Committee on Financial Markets
Committee on Fiscal Affairs
Committee on Competition Law and Policy
Committee on Consumer Policy
Tourism Committee
Maritime Transport Committee
Committee for Agriculture
Fisheries Committee
Committee for Scientific and Technology Policy
Committee for Information, Computer and Communications Policy
Committee for Education
Industry Committee
Steel Committee
Energy Policy Committee
Employment, Labour and Social Affairs Committee
Steering Committee of the Programme of Co-operation in the Field of Road Transport Research
Steering Committee of the Programme on Educational Building

ECONOMIC POLICY

The main organ for the consideration and direction of economic policy among the member countries is the Economic Policy Committee, which comprises governments' chief economic advisors and central bankers, and meets two or three times a year to review the economic and financial situation and policies of member countries. It has several working parties and groups, the most important of which are Working Party No. 1 on Macro-Economic and Structural Policy Analysis, Working Party No. 3 on Policies for the Promotion of Better International Payments Equilibrium and the Working Group on Short-Term Economic Prospects.

The Economic and Development Review Committee is responsible for the annual examination of the economic situation of each member country. Usually, a report is issued each year on each

SCIENCE SUBCOMMITTEE BUSINESS

Science Subcommittee (Chairman Boucher, D-Va.) of House Science, Space and Technology Committee will meet to consider pending business to be announced.

10am 2325 Rayburn Bldg. February 18

Veterans' Affairs

225-3527

LEGISLATIVE AGENDA OF VETERANS' ORGANIZATIONS Joint Hearing

House Veterans' Affairs Committee (Chairman Montgomery, D-Miss.) and Senate Veterans' Affairs Committee (Chairman Rockefeller, D-W.Va.) will hold joint hearings to hear veterans' organizations present their legislative agendas for the 103rd Congress.

9:30am 345 Cannon Bldg. February 23 & 25;

March 2 & 31

Agenda:

February 23: Disabled American Veterans

February 25: Paralyzed Veterans of America; Blinded Veterans of America; Military Order of the Purple Heart; Jewish War Veterans

March 2: Veterans of Foreign Wars

March 31: AMVETS; Veterans of World War I; Vietnam Veterans of America; American Ex-Prisoners of War; Non-Commissioned Officers Association

VA CONSTRUCTION PROJECTS

Hospitals and Health Care Subcommittee (Chairman Rowland, D-Ga.) of House Veterans' Affairs Committee will hold an oversight hearing on major construction projects at the Department of Veterans Affairs (VA).

9am 334 Cannon Bldg. March 3

MUSTARD GAS TESTING

Compensation, Pension and Insurance Subcommittee (Chairman Slattery, D-Kan.) of House Veterans' Affairs Committee will hold a hearing on allegations that the U.S. government tested mustard gas on U.S. soldiers during the Second World War.

9am 334 Cannon Bldg. March 10

Note

The offices of all members of Congress and all congressional committees and subcommittees may be reached by calling (202) 224-3121.

Joint Committees

Joint Economic

Committee Phone: 224-5171

ECONOMIC OUTLOOK

Joint Economic Committee (Chairman Rep. Obey, D-Wis.) will continue a series of hearings on the economic outlook for 1993.

10am & 1pm 2359 Rayburn Bldg. February 11

10am 2359 Rayburn February 12

Witnesses scheduled:

February 11:

10am: James Tobin - Yale University Department of Economics; Robert Solow - MIT Department of Economics; Allan Meltzer - Carnegie Mellon University

1pm: Ray Marshall - LBJ School of Public Affairs at the University of Texas; James Weill - general counsel, Children's Defense Fund; others TBA

February 12: Lawrence Chimerine - senior economic adviser, DRI/McGraw Hill; Donald Straszheim - chief economist, Merrill Lynch Capital Markets; Lawrence Kudlow - senior managing director and chief economist, Bear, Stearns & Co.

Joint Organization of Congress

226-0650

CONGRESSIONAL REORGANIZATION

Joint Organization of Congress Committee (Chairman Boren, D-Okla.) will continue hearings on proposals to revise and reorganize congressional operations.

Time and room TBA February 16, 18 and addl dates TBA

Agenda & witnesses scheduled:

February 16: Renewing Congress Project

Thomas Mann - Brookings Institution; Norman

Ornstein - American Enterprise Institute

February 18: Ethics process and institutional integrity

Send,

As you can see by the Congressional Monitor date (2/8/93) this was an 'upcoming' announcement.

Signed

(If you want, I will be glad to call)

The
Economist

B O O K O F

VITAL WORLD STATISTICS



**A PORTRAIT OF
EVERYTHING
SIGNIFICANT IN
THE WORLD TODAY**

Introduction by Robert J. Samuelson

Richest and poorest

GDP is the most widely used measure of a nation's economic size. The table gives 1988 data (or estimates where firm data are not available) for all the 146 countries analysed in this book.

The 'top twenty' countries are dominated by OECD economies, though the size of their population ensures that the USSR, China and India also figure highly in the list even though in terms of GDP per head (see pages 34 and 40) they count as comparatively poor. South Korea, as the largest of the East Asian Newly Industrializing Countries (NICs) also joins the top ranking group.

GDP can be measured in three ways: by summing the total output of all goods and services in the economy; by measuring expenditure (including any increase in stocks) on these goods and services; or by measuring income generated by the production of goods and services. Theoretically, the three methods should give an identical result. In the expenditure method $GDP = \text{private consumption} + \text{public consumption} + \text{investment (in fixed assets and stocks)} + \text{net exports (exports less imports)}$.

There are problems in obtaining GDP figures for certain countries. For obvious reasons, it is difficult to get reliable estimates for countries such as Afghanistan and Lebanon, devastated by war. But the problems are also great for some other countries, notably planned economies. Many planned economies attempt to measure net (or gross) material product (NMP) rather than GDP. NMP excludes certain services (such as public administration, health and education) included in GDP and is measured net of capital consumption (the imputed depreciation of fixed assets). In general, NMP will therefore represent only about 80–90% of GDP; in this table assumptions have been made, where appropriate, about the NMP/GDP ratio in order to give an estimated GDP figure.

A further problem concerns the exchange rate at which GDP or NMP data in national currency are converted to dollars. A number of countries have fixed or

controlled exchange rates that do not necessarily reflect the currency's true market value. Many exchange rates, even in market economies, are not entirely realistic but – providing the country concerned has a certain amount of free trade or other financial connections with the outside world – the rate cannot be entirely divorced from the currency's market value. In all these cases the officially quoted exchange rate has been used to convert GDP data to dollars.

In cases where trade and other financial dealings are rigidly controlled, the official exchange rate can grossly overvalue a currency. Using it to convert GDP estimates would, in consequence, produce overestimates of GDP. In such cases the black market, however, gives no better estimate of what a true rate should be. In each of these cases a compromise rate has been used, based on an assessment of what a theoretical 'true' rate could be. The most significant group of countries for which compromise rates have had to be used is East Europe. Many of these countries have had what are normally considered to be grossly overvalued 'official' exchange rates. In certain cases (such as Czechoslovakia) a much more realistic rate has recently been adopted following the political developments of 1989 and these new rates have been used as a guide. In others, a compromise rate has been used. For all these countries – and for those others (Iran, Iraq, Laos) where the official exchange rate was not suitable – the rates used are shown in the notes at the end of the table.

In cases where the country has more than one officially quoted rate the most appropriate has been selected.

Where an estimate is derived from statistics of material product, or where a judgement has had to be made about the exchange rate, the figures are marked with one asterisk. Two asterisks indicate cases where no reliable official data exist and an estimate has been made based on available information. These figures should be treated with great caution and could differ substantially from the 'truth'.

1988 GDP \$bn

OECD 14,037.43		OECD cont.		East Europe 915.15		Asia Pacific cont.	
Australia	232.80	Japan	2,859.93	Albania**	3.46	Fiji	1.03
Austria	126.90	Luxembourg	6.66	Bulgaria*	19.93	Hong Kong	54.60
Belgium	152.71	Netherlands	227.61	Czechoslovakia*	42.75	Indonesia	82.70
Canada	488.75	New Zealand	37.98	East Germany*	87.62	South Korea	171.30
Denmark	107.67	Norway	91.24	Hungary	27.83	Macao	2.60
Finland	104.72	Portugal	41.82	Poland*	65.10	Malaysia	34.60
France	949.99	Spain	338.50	Romania**	31.66	Papua NG	2.61
West Germany	1,208.29	Sweden	178.55	USSR*	583.10	Philippines	38.90
Greece	52.49	Switzerland	183.69	Yugoslavia	53.70	Singapore	23.90
Iceland	5.91	Turkey	72.42			Taiwan	118.90
Ireland	32.50	UK	826.32			Thailand	58.00
Italy	828.98	US	4,881.00				
				Asia Pacific 592.84			
				Brunei*	3.70		

GDP per head

The table shows each country's GDP per head in US dollars in 1988 and 1970 and as a percentage of the OECD average in 1988. GDP per head is often taken as an indicator of relative wealth but is not always a good guide to living standards. Several oil-producing countries rank relatively highly, but their wealth is not always reflected in the living standards of the mass of the population. In many countries, the overall figure for GDP per head can mask the gulf between the wealth of an elite and the poverty of the majority.

A more significant disadvantage arises from the very large differences in the cost of living that exist between countries. In recent years the UN, with the OECD and the European Commission, has started to compile estimates of GDP per head adjusted for living costs. These

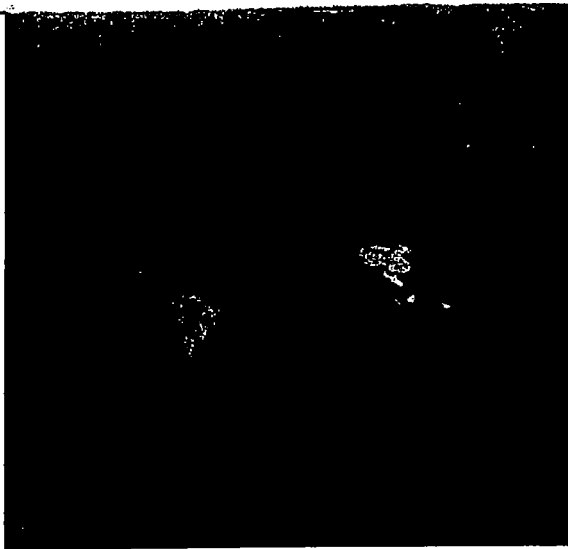
are known as PPP (purchasing power parity) indicators. PPP data are scaled so that the US = 100.

This research is still in its early stages, so estimates do not yet exist for all countries. Nevertheless, the data available give a very different impression from GDP per head statistics. While average GDP per head in the OECD area is 55 times that shown by some of the poorest countries, the contrast, while still very marked, is much less striking in the case of PPP ratios.

While, for example, the average level of wealth in the US appears to be 25 times that of Morocco on the GDP figures, in reality, since Moroccan living costs are much lower, US average wealth is less than eight times as great. The wealthier developing countries, such as Kuwait and Singapore, fall into line with OECD countries.

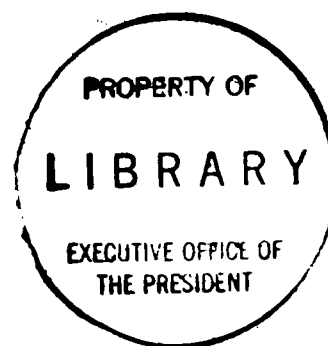
GDP per head

	1988 \$	1970 \$	as % OECD average (1988)	with PPP US = 100		1988 \$	1970 \$	as % OECD average (1988)	with PPP US = 100
OECD	17,097	2,969	100.0	74.5	Asia Pacific	1,559	186	9.2	14.4
Australia	14,083	2,520	82.7	71.1	Brunei	15,417		90.5	
Austria	16,675	1,948	97.9	66.1	Fiji	1,431	400	8.4	
Belgium	15,394	2,669	90.4	64.7	Hong Kong	9,613	900	56.4	60.4
Canada	18,834	4,107	110.6	92.5	Indonesia	473	90	2.8	9.4
Denmark	20,988	3,215	123.2	74.2	South Korea	4,081	260	24.0	24.3
Finland	21,156	2,380	124.2	69.5	Macao	5,909		34.7	
France	17,004	2,831	99.8	69.3	Malaysia	2,045	390	12.0	21.9
West Germany	19,743	3,049	115.9	73.8	Papua NG	733	260	4.3	10.5
Greece	5,244	1,170	30.8	36.0	Philippines	662	230	3.9	10.7
Iceland	23,640		138.8	79.0	Singapore	9,019	950	52.9	72.6
Ireland	9,181	1,315	53.9	40.9	Taiwan	5,975		35.1	
Italy	14,432	1,875	84.7	65.6	Thailand	1,063	210	6.2	17.0
Japan	23,325	1,930	136.9	71.5					
Luxembourg	18,000	3,468	105.7	79.0	Asian Planned	301		1.8	
Netherlands	15,421	2,585	90.5	68.2	Burma	250		1.5	
New Zealand	11,544		67.8	60.9	Cambodia	83		0.5	
Norway	21,724	2,887	127.5	84.4	China	301	120	1.8	12.1
Portugal	4,017	700	23.6	33.8	North Korea	858		5.0	
Spain	8,668	1,117	50.9	46.0	Laos	129		0.8	
Sweden	21,155	4,149	124.2	76.9	Mongolia	1,053		6.2	
Switzerland	27,748	3,350	162.9	87.0	Vietnam	154		0.9	
Turkey	1,382	275	8.1	21.8					
UK	14,477	2,209	85.0	66.1	South Asia	319	106	1.9	5.3
US	19,815	4,922	116.3	100.0	Afghanistan	143		0.8	
East Europe	2,162		12.7		Bangladesh	179	100	1.1	5.0
Albania	1,102		6.5		Bhutan	197		1.2	
Bulgaria	2,217		13.0		India	335	100	2.0	4.7
Czechoslovakia	2,737		16.1		Nepal	160	80	0.9	4.1
East Germany	5,256		30.9		Pakistan	384	150	2.3	9.0
Hungary	2,625		15.4	31.2	Sri Lanka	423	170	2.5	11.7
Poland	1,719		10.1	24.5					
Romania	1,374		8.1		Sub-Saharan Africa	484	169	2.8	6.5
USSR	2,055		12.1		Angola	569		3.3	
Yugoslavia	2,279	650	13.4	29.2	Benin	389	110	2.3	6.5



World Development Report 1993
Investing in Health

Published for the World Bank
Oxford University Press



		Monetary holdings, broadly defined					Nominal interest rates of banks (average annual percentage)			
		Average annual nominal growth rate (percent)		Average outstanding as a percentage of GDP			Average annual inflation (GDP deflator) 1980-91		Deposit rate	
		1970-80	1980-91	1970	1980	1991			1980	1991
									Lending rate	
									1980	1991
67	Azerbaijan	..	..	..	..	..	..	..	..	..
68	Turkmenistan	..	..	..	..	..	..	..	..	..
69	Turkey	32.9	52.7	27.9	17.2	21.6	44.7	..	..	..
70	Poland	..	58.6	..	58.4	29.4	63.1	8.0	62.9	25.7
71	Bulgaria	..	..	..	..	..	7.9	3.0	27.8	8.0
72	Costa Rica	..	..	..	..	..	..	..	..	101.4
73	Algeria	30.6	25.7	18.9	38.8	38.3	22.9	..	1.6	5.1
74	Panama	24.1	14.3	53.6	58.5	..	10.2	..	27.3	..
75	Armenia	..	..	..	36.9	..	2.4	..	..	38.9
76	Chile	..	..	..	..	..	..	..	..	..
77	Iran, Islamic Rep.	194.2	29.8	12.5	21.0	38.5	20.5	..	..	..
78	Moldova	33.2	16.7	26.1	54.5	..	14.1	37.5	22.3	47.1
79	Ukraine	..	..	..	..	..	..	..	..	28.6
80	Mauritius	24.3	22.0	37.5	41.1	65.4	8.1	..	..	..
81	Czechoslovakia	..	6.6	..	..	63.8	3.5	2.7	12.3	17.8
82	Kazakhstan	..	..	..	..	..	..	..	8.1	..
83	Malaysia	25.2	12.6	34.4	69.8	..	1.7	6.2	7.2	7.8
Upper-middle-income		..	..	..	..	..	..	..	..	8.1
84	Botswana	..	25.8	..	28.2	27.0	13.3	..	..	..
85	South Africa	15.6	16.6	59.9	50.9	56.2	14.4	5.0	11.4	8.5
86	Lithuania	..	..	..	..	..	..	5.5	17.3	9.5
87	Hungary	..	..	..	..	..	10.3	..	..	11.8
88	Venezuela	26.4	20.2	24.1	43.0	37.3	21.2	3.0	23.0	20.3
89	Argentina	140.8	368.5	27.5	22.2	7.6	416.8	..	9.0	28.0
90	Uruguay	78.4	69.1	24.5	32.1	43.8	64.4	31.1	..	29.8
91	Brazil	9.7	..	..	18.4	..	327.7	..	60.3	..
92	Mexico	-47.0	62.0	26.1	26.2	24.1	66.5	50.3	75.2	112.9
93	Belarus	..	..	..	..	..	..	115.0	913.2	152.9
94	Russian Federation	..	..	..	..	..	..	20.6	17.1	28.1
95	Latvia	..	..	..	..	..	..	..	..	..
96	Trinidad and Tobago	27.9	5.9	28.2	32.0	53.6	6.4	..	..	..
97	Gabon	31.3	5.2	14.5	15.2	21.7	1.3	5.8	10.0	13.2
98	Estonia	..	..	..	..	..	..	7.5	8.8	12.5
99	Portugal	20.2	18.6	87.6	80.8	74.7	17.4	..	..	16.0
100	Oman	29.4	11.0	..	13.8	30.6	-3.0	19.0	14.6	18.8
101	Puerto Rico	..	..	..	..	..	3.4	..	7.1	22.9
102	Korea, Rep.	30.4	21.3	32.1	31.7	52.3	5.7	..	..	9.5
103	Greece	23.9	22.3	42.9	61.6	79.3	17.7	19.5	10.0	18.0
104	Saudi Arabia	43.7	7.8	17.6	18.6	..	-3.1	14.5	20.7	21.3
105	Yugoslavia	28.4	119.0	54.8	59.1	..	122.9	..	..	29.5
Low- and middle-income		..	..	..	..	..	..	..	..	..
Sub-Saharan Africa		..	..	..	..	..	..	..	..	..
East Asia & Pacific		..	..	..	..	..	..	..	..	..
South Asia		..	..	..	..	..	..	..	..	..
Europe and Central Asia		..	..	..	..	..	..	..	..	..
Middle East & N. Africa		..	..	..	..	..	..	..	..	..
Latin America & Caribbean		..	..	..	..	..	..	..	..	..
Severely indebted		..	..	..	..	..	..	..	..	..
High-income economies		..	..	..	..	..	..	..	..	..
OECD members		..	..	..	..	..	..	..	..	..
106	Ireland	19.1	6.7	64.0	58.1	46.8	5.8	12.0	5.2	16.0
107	Israel	54.5	99.2	15.0	14.7	56.6	89.0	..	13.9	10.6
108	New Zealand	15.1	..	51.4	50.9	..	10.3	..	176.9	26.6
109	Spain	20.1	10.8	68.8	74.4	68.8	8.9	9.0	12.6	12.1
110	Hong Kong	..	..	..	69.5	..	7.5	13.1	10.5	16.9
111	Singapore	..	..	..	..	..	..	..	..	14.4
112	United Kingdom	17.1	13.5	66.2	74.4	126.1	1.9	9.4	4.6	11.7
113	Australia	15.2	..	49.2	46.0	..	5.8	..	..	7.6
114	Italy	20.4	12.2	43.6	57.9	74.5	7.0	14.1	5.3	11.5
115	Netherlands	20.1	12.0	79.3	81.9	78.9	9.5	8.6	10.4	16.4
116	Belgium	14.6	..	53.9	77.2	..	1.8	12.7	6.6	10.6
117	Austria	..	..	..	..	..	..	6.0	3.2	13.5
118	France	10.8	7.0	56.7	57.0	..	4.2	..	..	12.4
119	Canada	13.7	7.4	54.0	72.6	87.3	3.6	7.7	6.3	12.9
120	United States	15.6	9.9	57.8	69.7	..	5.7	5.0	3.8	..
121	Germany	17.5	8.4	48.4	65.0	75.7	4.3	6.3	6.7	18.7
122	Denmark	10.0	8.0	60.4	58.3	67.0	4.2	12.9	8.6	14.3
123	Finland	..	..	..	..	..	..	..	..	9.9
124	Norway	..	..	..	..	..	..	..	..	8.5
125	Sweden	9.4	6.4	52.8	60.7	68.2	2.8	..	..	..
126	Japan	12.4	11.1	44.8	42.6	59.6	5.2	8.0	7.6	12.0
127	Switzerland	15.4	12.9	39.8	39.5	56.2	6.6	10.8	7.2	12.5
128	World	12.8	10.6	54.6	51.6	63.9	5.2	..	7.5	11.4
129	Fuel exporters	11.4	9.2	48.1	46.5	45.5	7.4	5.0	9.6	9.8
130	..	..	..	..	..	..	..	11.3	8.0	12.6
131	..	16.0	8.9	94.7	134.0	183.1	1.5	..	..	14.2
132	..	5.4	6.8	109.8	107.4	112.0	3.8	5.5	3.3	15.1
133	..	..	..	..	..	..	..	7.6	8.4	16.1
134	..	..	..	..	..	..	..	..	..	7.5
135	..	..	..	..	..	..	..	..	..	7.8

4 Data refer to the Federal Republic of Germany before unification.

STATISTICS DIRECTORATE
DIRECTION DES STATISTIQUES

PURCHASING POWER PARITIES AND REAL EXPENDITURES

EKS RESULTS
VOLUME 1
RÉSULTATS EKS

PARITÉS DE POUVOIR D'ACHAT ET DÉPENSES RÉELLES

1990

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT
ORGANISATION DE COOPÉRATION ET DE DÉVELOPPEMENT ÉCONOMIQUES

~~US dollar~~ = US Dollars

Table 2.5

Purchasing power parities for final expenditure on GDP in national currencies per US dollar

	Belgium Belgique	Denmark Danemark	France France	Germany Allemagne	Greece Grèce	Ireland Irlande	Italy Italie	Luxembourg Luxembourg	Netherlands Pays-bas	Portugal Portugal	Spain Espagne	United Kingdom Royaume-Uni	EEC Total Total CEE
<i>At international prices - Aux prix internationaux</i>													
1. Private final consumption expenditure	35.5	8.72	5.88	1.81	123	0.605	1213	32.2	1.89	92.7	99.4	0.525	0.814
2. Food, beverages and tobacco	34.3	8.74	5.53	1.63	128	0.664	1191	31.8	1.76	107.0	96.7	0.521	0.776
3. Food	34.6	8.17	5.79	1.66	131	0.590	1256	34.2	1.78	112.4	103.4	0.476	0.789
4. Bread and cereals	29.8	7.72	5.18	1.48	122	0.507	1077	29.8	1.51	84.4	104.1	0.381	0.688
5. Meat	40.2	8.49	6.79	1.87	132	0.577	1454	41.6	2.42	122.4	99.4	0.475	0.875
6. Fish	29.1	7.10	5.47	1.53	138	0.435	1536	33.7	1.32	96.2	91.3	0.413	0.752
7. Milk, cheese and eggs	34.2	7.83	5.74	1.41	164	0.706	1395	33.4	1.62	138.9	123.4	0.566	0.827
8. Oils and fats	33.2	8.19	5.37	1.46	143	0.555	1130	33.5	1.65	113.5	112.4	0.450	0.747
9. Fruit, vegetables and potatoes	38.0	9.56	6.29	1.81	115	0.708	1031	31.7	1.94	105.3	104.1	0.559	0.778
10. Other food	33.7	8.48	5.22	1.82	163	0.638	1598	34.7	1.60	153.6	118.6	0.510	0.834
11. Beverages	33.4	9.47	4.51	1.25	123	0.903	790	29.7	1.64	78.5	67.5	0.598	0.649
12. Non-alcoholic beverages	39.2	10.74	4.40	1.46	128	0.826	1047	29.7	1.76	134.1	104.2	0.484	0.709
13. Alcoholic beverages	31.7	9.16	4.55	1.19	121	0.973	725	30.4	1.62	68.7	59.2	0.666	0.627
14. Tobacco	34.5	12.23	5.02	2.17	115	1.006	1208	27.5	1.78	105.1	82.2	0.803	0.897
15. Clothing and footwear	46.3	9.96	8.32	2.16	163	0.673	1658	45.3	2.16	145.8	136.0	0.528	1.017
16. Clothing including repairs	46.5	10.04	8.39	2.18	166	0.704	1677	45.2	2.08	150.9	153.6	0.533	1.034
17. Footwear including repairs	45.6	9.67	8.04	2.10	152	0.564	1579	45.8	2.53	126.6	91.4	0.512	0.930
18. Gross rent, fuel and power	35.1	7.41	5.22	1.98	91	0.382	821	30.0	1.92	45.4	76.2	0.448	0.709
19. Gross rent and water charges	35.2	6.93	4.83	1.99	80	0.290	664	31.1	1.93	28.9	65.4	0.406	0.642
20. Fuel and power	42.2	10.26	7.31	2.15	155	0.812	1717	35.0	2.11	157.7	131.6	0.666	1.034
21. Household equipment and operation	36.6	8.14	6.10	1.70	126	0.651	1348	37.4	1.86	100.8	107.4	0.529	0.834
22. Furniture, floor coverings and repairs	38.7	7.91	6.12	1.66	129	0.605	1344	38.7	1.99	119.0	104.5	0.512	0.832
23. Household textiles and repairs	35.0	5.18	8.16	1.79	107	0.912	1221	35.5	1.51	95.6	90.3	0.512	0.805
24. Household appliances and repairs	37.0	8.18	6.62	1.73	182	0.647	1249	38.3	2.00	117.6	122.4	0.508	0.842
25. Other household goods and services	36.0	9.89	5.63	1.75	115	0.631	1442	36.9	1.80	85.2	111.8	0.569	0.845
26. Medical and health care	26.1	8.20	4.34	1.78	93	0.578	1044	28.7	1.70	78.7	77.4	0.399	0.719
27. Medical and pharmaceutical products	31.1	9.84	3.75	2.16	77	0.720	952	31.7	2.63	79.7	68.6	0.533	0.712
28. Medical and health services	25.4	7.40	4.81	1.64	114	0.512	1178	28.8	1.43	83.8	93.1	0.323	0.725
29. Transport and communication	36.5	10.01	6.33	1.87	131	0.778	1342	30.3	2.03	140.8	107.3	0.685	0.908
30. Personal transport equipment	33.8	12.97	6.26	1.71	300	0.952	1360	31.4	2.27	237.9	143.5	0.669	0.919
31. Operation of transport equipment	41.0	11.09	7.19	2.06	130	0.719	1656	37.8	2.29	125.3	113.0	0.721	1.008
32. Purchased transport services	36.1	7.88	6.24	1.93	65	0.674	969	30.4	1.90	81.3	72.7	0.753	0.801
33. Communication	45.7	5.24	4.80	2.24	62	0.833	1109	18.4	1.27	101.3	73.3	0.697	0.809
34. Education, recreation and culture	39.3	8.02	6.63	1.79	139	0.541	1555	29.8	1.79	109.8	117.1	0.478	0.861
35. Recreational equipment and repairs	45.2	8.04	7.31	1.99	233	0.743	1616	41.5	1.68	129.3	140.9	0.521	0.938
36. Recreational and cultural services	43.6	8.00	7.06	1.74	78	0.402	1797	27.6	1.94	115.9	136.5	0.487	0.880
37. Books, magazines and newspapers	37.3	10.41	5.19	1.97	190	0.687	1463	31.7	2.62	123.4	135.6	0.470	0.870
38. Education	21.2	5.79	6.77	1.22	54	0.317	1174	11.4	1.37	51.3	50.9	0.383	0.573
39. Miscellaneous goods and services	38.3	10.28	6.65	1.76	147	0.701	1387	35.2	2.07	83.1	112.7	0.599	0.881
40. Restaurants, cafes and hotels	39.3	9.67	6.14	1.63	154	0.677	1407	35.8	1.99	81.1	122.0	0.569	0.862
41. Other goods and services	36.9	10.89	7.29	1.84	135	0.716	1351	34.1	2.13	85.2	96.9	0.634	0.898
42. Net purchases abroad	72.0	17.66	11.91	3.67	250	1.224	2458	65.3	3.83	188.2	201.6	1.063	1.533
43. Government final consumption expenditure	31.4	7.46	5.68	1.93	108	0.572	1288	41.9	1.76	65.5	77.1	0.437	0.757
44. Collective government services	33.5	7.49	6.04	1.97	117	0.563	1392	43.2	1.81	63.6	81.2	0.442	0.782
45. Individual government services	29.5	7.32	5.35	1.91	96	0.579	1198	40.7	1.72	66.5	72.9	0.433	0.733
46. Gross fixed capital formation	35.8	8.02	5.85	1.93	154	0.646	1361	39.3	2.11	118.7	106.2	0.650	0.888
47. Construction	33.3	7.89	5.11	1.90	128	0.606	1199	39.7	2.14	89.1	92.0	0.655	0.818
48. Residential buildings	37.5	9.98	5.35	2.23	145	0.619	1238	41.8	2.38	82.6	83.0	0.613	0.855
49. Non-residential buildings	31.4	8.36	5.66	1.84	135	0.659	1170	43.5	2.11	91.9	84.0	0.703	0.845
50. Civil engineering works	29.3	5.26	4.08	1.50	101	0.522	1215	32.3	1.73	96.6	103.4	0.661	0.722
51. Machinery and equipment	39.8	8.29	7.04	2.00	198	0.712	1612	39.4	2.14	170.0	128.6	0.661	0.990
52. Transport equipment	42.0	10.62	7.43	2.08	253	0.832	1711	41.6	2.45	202.5	152.1	0.778	1.087
53. Non-electrical equipment	39.9	8.00	6.99	1.97	181	0.718	1636	41.0	2.12	163.5	120.9	0.661	0.982
54. Electrical equipment	39.4	7.03	7.21	2.09	210	0.569	1526	35.9	1.99	162.6	135.3	0.589	0.963
55. Increase in stocks	29.2	6.95	4.96	1.43	121	0.549	1092	27.1	1.55	104.3	88.2	0.445	0.698
56. Balance of exports and imports	33.3	6.17	5.43	1.61	158	0.603	1195	33.3	1.82	142.2	101.6	0.561	0.788
57. Gross domestic product	34.7	8.27	5.82	1.84	124	0.608	1251	34.9	1.91	91.3	96.4	0.530	0.820

Tableau 2.5

Parités de pouvoir d'achat des dépenses finales imputées au PIB en monnaies nationales par dollar des É-U

Austria Autriche	Switzerland Suisse	Finland Finlande	Iceland Islande	Norway Norvège	Sweden Suède	Turkey Turquie	Australia Australie	New Zealand Nouvelle-Zélande	Japan Japon	Canada Canada	United States États-Unis	OECD Total Total OCDE	
<i>At international prices - Aux prix internationaux</i>													
12.5	1.96	6.04	79.9	9.39	8.35	1404	1.27	1.45	182	1.18	0.879	1.00	1. Consommation finale privée
12.1	2.04	6.87	99.6	11.02	9.80	1564	1.05	1.43	215	1.23	0.797	1.00	2. Produits alimentaires, boissons et tabac
12.2	2.11	6.21	90.6	9.99	9.35	1606	0.98	1.25	222	1.09	0.782	1.00	3. Produits alimentaires
11.6	1.90	6.73	76.2	9.26	9.76	919	1.14	1.27	207	1.08	0.824	1.00	4. Pain et céréales
13.0	2.88	7.08	105.2	12.90	11.32	1768	0.81	1.28	287	1.06	0.742	1.00	5. Viande
10.9	1.68	3.75	49.1	7.02	6.91	1696	0.95	1.00	157	0.92	0.743	1.00	6. Poisson
13.3	2.21	5.34	99.4	10.00	8.27	2464	1.14	1.36	225	1.28	0.802	1.00	7. Lait, fromage et œufs
14.1	2.94	9.09	101.0	8.11	11.37	1983	0.90	1.07	342	1.12	0.940	1.00	8. Huiles et grasses
10.9	1.76	5.87	105.8	9.32	9.29	1516	0.96	1.28	208	1.06	0.879	1.00	9. Fruits, légumes et pommes de terre
13.8	1.98	6.76	91.2	10.22	9.18	2034	1.25	1.34	205	1.21	0.795	1.00	10. Autres produits alimentaires
10.6	1.92	10.94	147.1	14.72	12.86	1983	1.45	2.05	234	1.53	0.848	1.00	11. Boissons
10.2	1.55	7.68	125.5	13.06	12.12	3638	1.39	1.60	228	1.40	0.778	1.00	12. Boissons non alcoolisées
10.8	2.14	11.97	162.8	15.65	13.15	1365	1.51	2.19	240	1.59	0.894	1.00	13. Boissons alcoolisées
14.2	1.51	7.08	108.6	15.80	9.70	1002	1.16	2.14	132	2.04	0.852	1.00	14. Tabac
14.4	2.01	6.53	102.3	9.38	6.98	1777	1.27	1.47	161	1.18	0.751	1.00	15. Habillement et chaussures
14.6	2.03	6.68	107.2	9.61	6.97	1718	1.21	1.46	165	1.14	0.741	1.00	16. Articles d'habillement y compris les réparations
13.7	1.92	5.91	80.5	8.40	7.05	1992	1.59	1.50	136	1.38	0.814	1.00	17. Chaussures y compris les réparations
10.9	1.85	4.71	52.5	7.52	7.39	835	1.42	1.47	205	1.24	1.006	1.00	18. Logement, chauffage et éclairage
10.2	2.10	5.06	52.1	9.29	7.70	644	1.55	1.62	205	1.43	1.117	1.00	19. Logement et charges de distribution d'eau
15.4	1.53	4.21	59.1	5.84	7.22	2032	0.98	1.02	218	0.79	0.759	1.00	20. Chauffage et éclairage
12.5	1.72	5.58	76.1	8.00	7.47	1828	1.25	1.52	165	1.18	0.870	1.00	21. Biens et services ménagers
12.1	1.54	5.28	84.4	6.52	5.97	1471	1.27	1.55	211	1.25	0.885	1.00	22. Meubles, revêtements de sols et réparations
10.4	1.55	2.95	71.8	6.41	5.44	1415	1.23	0.91	96	1.70	1.160	1.00	23. Textiles ménagers et réparations
15.5	1.89	5.74	91.6	7.96	7.58	3377	1.22	1.96	196	1.11	0.746	1.00	24. Appareils électro-ménagers et réparations
12.4	1.93	6.83	69.6	10.33	9.86	1720	1.30	1.56	152	1.11	0.873	1.00	25. Autres biens et services ménagers
10.1	2.03	5.30	72.7	7.26	7.13	855	1.22	1.25	100	1.11	1.217	1.00	26. Dépenses de santé
14.0	2.08	5.05	87.6	6.98	6.14	1038	1.03	1.44	123	1.43	1.240	1.00	27. Médicaments et autres produits pharmaceutiques
9.2	2.03	5.65	68.3	7.51	8.47	769	1.34	1.21	93	0.99	1.234	1.00	28. Services de santé
14.1	1.80	5.64	63.9	9.83	7.91	1788	1.33	1.44	159	1.19	0.832	1.00	29. Transport et communications
13.3	1.41	7.63	76.9	11.97	7.15	6967	1.75	1.90	128	1.19	0.875	1.00	30. Achats de véhicules personnels
15.6	2.21	5.70	65.9	8.54	10.76	1664	1.29	1.43	184	1.21	0.752	1.00	31. Dépenses d'utilisation de véhicules personnels
11.8	1.89	5.03	66.7	9.51	6.37	783	1.07	1.82	150	1.13	1.031	1.00	32. Achats de services de transport
16.4	1.56	2.88	31.5	9.80	4.84	847	1.05	0.56	174	1.29	0.956	1.00	33. Communications
14.9	1.83	6.63	85.9	9.07	8.20	1826	1.34	1.58	154	1.16	0.891	1.00	34. Loisirs, enseignement et culture
16.6	2.09	6.88	104.2	10.66	9.14	3234	1.66	1.83	135	1.28	0.846	1.00	35. Matériel de loisirs
14.1	1.93	6.23	73.4	9.71	7.51	630	1.08	1.70	173	0.99	0.830	1.00	36. Services de loisirs et culture
14.1	1.76	8.29	131.4	9.02	9.66	1788	1.30	1.20	178	1.20	0.773	1.00	37. Livres, périodiques et journaux
14.0	1.18	4.60	38.9	3.94	5.74	1426	1.28	1.11	152	1.02	1.176	1.00	38. Enseignement
13.7	2.24	7.45	109.1	11.71	10.71	1357	1.38	1.50	227	1.14	0.776	1.00	39. Autres biens et services
13.5	2.11	7.35	127.4	11.80	10.49	1404	1.31	1.35	247	1.00	0.738	1.00	40. Restaurants, cafés et hôtels
13.7	2.37	7.37	87.2	11.52	10.77	1367	1.45	1.67	209	1.28	0.810	1.00	41. Autres biens et services
25.4	3.97	12.22	161.6	18.99	16.89	2844	2.58	2.95	368	2.40	1.781	1.00	42. Achats nets directs à l'extérieur
12.0	2.13	5.22	62.8	7.79	8.02	804	1.19	1.24	149	1.27	1.048	1.00	43. Consommation finale des adm. pub.
12.6	2.20	5.03	61.8	7.91	8.19	852	1.19	1.23	154	1.30	1.018	1.00	44. Services collectifs des adm. pub.
11.5	2.08	5.31	62.5	7.66	7.87	746	1.19	1.26	144	1.24	1.106	1.00	45. Services individuels des adm. pub.
12.2	1.83	4.95	62.9	7.45	7.94	1540	1.13	1.48	168	0.97	0.770	1.00	46. Formation brute de capital fixe
12.0	1.86	4.76	58.5	6.12	9.00	1294	1.05	1.36	189	0.90	0.795	1.00	47. Construction
13.9	1.90	5.13	59.5	6.83	9.41	1868	0.97	1.36	192	0.90	0.789	1.00	48. Immeubles résidentiels
12.1	1.93	4.90	60.4	5.88	9.35	1258	1.20	1.49	162	0.96	0.815	1.00	49. Immeubles non résidentiels
9.1	1.71	3.97	54.3	5.42	7.93	805	1.01	1.24	211	0.84	0.815	1.00	50. Ouvrages de génie civil
12.7	1.78	5.24	70.4	9.65	6.93	1900	1.27	1.65	149	1.10	0.759	1.00	51. Machines et matériel d'équipement
16.5	2.11	7.54	86.3	13.25	9.40	4542	1.30	1.78	114	1.24	0.800	1.00	52. Matériel de transport
11.6	1.86	5.03	66.0	8.01	6.51	1496	1.29	1.67	182	1.10	0.722	1.00	53. Machines non électriques
12.6	1.37	3.78	63.9	6.91	6.08	1843	1.23	1.51	126	1.04	0.933	1.00	54. Machines électriques
10.1	1.45	4.87	67.6	7.75	6.36	1517	0.96	1.21	135	0.91	0.611	1.00	55. Variation des stocks
11.3	1.38	3.83	58.3	6.26	5.92	2613	1.28	1.68	145	1.17	1.000	1.00	56. Solde des exportations et des importations
12.4	1.94	5.62	72.7	8.57	8.22	1313	1.22	1.42	172	1.15	0.880	1.00	57. Produit intérieur brut

DO MINIMUM WAGES REDUCE EMPLOYMENT? A CASE STUDY OF CALIFORNIA, 1987-89

DAVID CARD*

In July 1988, California's minimum wage rose from \$3.35 to \$4.25. During the previous year, 11% of workers in the state and 50% of California teenagers had earned less than the new state minimum. Using published data and samples from the Current Population Survey, the author compares changes in the labor market outcomes of California workers to the corresponding changes in a group of states with no increase in the minimum wage. The minimum wage increase raised the earnings of low-wage workers by 5-10%. Contrary to conventional predictions, however, there was no decline in teenage employment, or any relative loss of jobs in retail trade.

Few substantive issues generate as much agreement among economists as the effects of minimum wage legislation. It is widely believed that the imposition of a binding wage floor will reduce the employment of younger and less-skilled workers. Although the theoretical arguments underlying this consensus are simple and compelling, the empirical evidence is surprisingly limited (see Brown, Gilroy, and Kohen 1982 for a comprehensive survey). A major obstacle confronting most recent studies of minimum wage legislation is the near-universality of the federal minimum rate. Despite some specific exceptions in the law, the vast majority of workers are covered by the same wage floor.¹ Since the federal law is

adjusted infrequently, the number of independent observations on the effect of the minimum wage is small.

In the late 1980s, however, several states responded to the decade-long decline in the real value of the federal minimum wage by establishing wage floors above the federal rate. These state-specific increases provide a valuable opportunity to study the effects of minimum wage legislation. As in a conventional non-experimental program evaluation, labor market trends in other states can be used to infer what would have happened to employment, wages, and unemployment in the absence of the law. A similar "treatment and control group" methodology was used in many early studies of the minimum wage (see Lester 1946, for example), but fell out of favor as the coverage of the federal minimum expanded and longer time series of aggregate data became available.

Among the states that raised their

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¹ At present, roughly 85% of workers are covered

by the federal law. In addition, many states have historically maintained state minimums equal to the federal rate for workers outside the federal law. See Questor (1981).

minimum rates, California enacted the most notable change. In July 1988 California's minimum wage increased from \$3.35 (the prevailing federal rate) to \$4.25 per hour. In the previous year 11% of all workers in the state and 50% of California teenagers earned between \$3.35 and \$4.24 per hour. Furthermore, the California law applied very broadly, extending even to tipped employees in retail trade. Estimates presented by Brown, Gilroy, and Kohen (1982) suggest that teenage employment would fall by 3–8% in response to the rise in the minimum wage.

This paper uses data from the Current Population Survey (CPS) and other sources to measure the effects of the increase in the California minimum wage. The available CPS samples are large: about 20,000 individuals of working age and 1,500 teenagers per year. These samples, together with samples of individuals from other states with no change in minimum wage laws, permit fairly precise inferences on the effects of the increased minimum. I tabulate the relative changes in wages, employment, and unemployment for different age-ethnic-education groups and compare the magnitude of these changes to the fraction of the group who earned less than \$4.25 in the year before the law was enacted. I also devote special attention to two heavily affected groups: teenagers and employees in retail trade.

A Brief History

The rise in California's minimum wage followed a year-long sequence of legislative, administrative, and judicial decisions. In May 1987, the State Assembly's Labor and Employment Commission voted to raise the minimum from \$3.35 to \$4.25 per hour on January 1 1988, with further increases in 1989 and 1990. A modified proposal containing a single increase to \$4.25 was subsequently passed by both houses of the legislature. This bill was vetoed by the governor, who cited the pending decision of the state's Industrial Welfare Commission (IWC). Under California law the IWC is empowered to set

minimum wages for workers in the state. The Commission had begun hearings on a new minimum in 1986, and in December 1987 announced an increase in the minimum wage to \$4.25, effective July 1, 1988.

The IWC also established a subminimum rate of \$3.50 per hour for tipped employees. Previous California regulations did not permit a tipped subminimum, and the new provision was immediately appealed by the California Labor Federation. An appellate court panel ruled against the subminimum in June 1988. The July 1 effective date therefore passed amid confusion as to the actual minimum wage for tipped employees. The issue was resolved four months later when the State Supreme Court upheld the lower court and rejected the subminimum provision. By the end of 1988 the \$4.25 minimum rate was clearly established for most workers in the state, with minor exemptions for a few specific occupations and employees under 18 years of age (who faced a \$3.60 minimum).

Characteristics of Low-Wage Workers in 1987

Table 1 presents information on various wage groups in California in the year before the new minimum. The data are based on a one-quarter sample of the 12 monthly CPS surveys conducted during 1987. (The samples are described in an appendix to the unpublished version of this paper—Card 1991.) Each month, wage earners in two of the eight rotation groups in the CPS are asked to report the usual hours and usual hourly or weekly earnings on their main job. For individuals who report weekly earnings I have constructed an hourly wage by dividing usual weekly earnings by usual weekly hours.² Workers are then sorted into categories depending on the value of their actual or imputed hourly wage.

In 1987, 1.3% of California workers

² I ignore the wages of individuals whose wage or earnings responses are imputed by the Census Bureau.

affected workers
↑

Table 1. Characteristics of California Wage and Salary Earners, 1987.

Characteristic	All Earners	Earners with Hourly Wage:	
		< \$3.35	\$3.35-4.24
1. Average Hourly Wage (\$/hour)	10.69 (0.06)	2.64 (0.05)	3.70 (0.01)
2. Usual Hours Per Week	38.5 (0.1)	36.9 (1.9)	30.7 (0.4)
3. Usual Weekly Earnings (\$/week)	426.3 (2.8)	97.9 (5.4)	114.3 (1.4)
4. Average Age (years)	35.3	31.9	27.7
5. Percent Age 16-19	6.4	26.2	31.0
6. Percent Age 20-24	14.1	14.7	23.0
7. Percent Enrolled (of those age 16-24)	30.1	41.8	47.0
8. Ethnicity (%)			
a. Hispanic	22.5	36.8	39.0
b. Black Non-Hispanic	6.1	4.1	4.6
c. White Non-Hispanic	62.7	45.2	46.6
9. Percent Female	45.8	67.2	57.9
10. Percent in Central City	37.4	47.6	39.4
11. Average Family Income ^a (\$/year)	35,548 (222)	24,863 (2,023)	24,338 (649)
12. Percent with Family Income < \$15,000/Year	19.0	48.8	44.2
13. Industry Distribution (%)			
a. Agriculture	2.7	5.4	7.4
b. Low-wage Manufacturing ^b	2.3	9.4	7.3
c. Retail Trade	16.7	21.9	48.0
14. Sample Size	11,591	150	1,220

Notes: Data are taken from 1987 Current Population Survey. Earners are wage and salary earners age 16-68, excluding self-employed and unpaid workers. Standard errors in parentheses.

^a Reported interval values are assigned interval means. See text.

^b Apparel, textiles, furniture, toys, and sporting goods manufacturing.

earned less than the prevailing federal minimum of \$3.35 per hour. The characteristics of these workers are reported in column 2 of Table 1. Since California law prescribed a minimum of \$3.35 for most workers not covered by the federal statute, some of these individuals were presumably working illegally for noncomplying employers. Others, including some 16- and 17-year-olds and some live-in household workers, legally earned less than the federal/state minimum. A third group of subminimum-wage earners consists of salaried workers who under-reported their usual weekly earnings or over-reported their usual hours. The importance of this phenomenon is suggested by the fact that salaried workers are three times more likely to report a subminimum wage than hourly rated workers, even though (on average) salaried workers have substan-

tially higher earnings than hourly rated workers.

A much larger group of workers (10.8%) were paid either exactly \$3.35 or between \$3.36 and \$4.24 per hour. For simplicity, I refer to these as "affected workers," since it is precisely these individuals who would have either lost their jobs or had their wages raised if the new minimum had taken effect in 1987. As shown in row 13c of the table, about one-half of affected workers were employed in retail trade, with another 15% in agriculture and low-wage manufacturing industries.

A comparison of the demographic characteristics of all wage earners and those in the affected group suggests that the latter are younger and more likely to be female, Hispanic, and enrolled in school. Over one-half of affected wage earners were

under age 25. Indeed, in 1987, 52% of California teenagers and 29% of those age 20 to 24 reported wages of \$3.35–4.24 per hour.

The family income data in rows 11 and 12 suggest that the low hourly earnings of affected workers are associated with low family income. The income measure here pertains to the 12-month period ending 4 months before the CPS interview.³ Some 44% of affected wage earners lived in families with annual incomes less than \$15,000. By comparison, 24% of all Californians age 16–68 and 19% of employed individuals lived in such families. Despite their relative concentration in the lower tail of the family income distribution, there are still significant numbers of affected workers in high-income families. Any distributional consequences of the rise in the California minimum wage are necessarily modest, although perhaps more favorable than suggested by earlier studies.⁴

Effects on the Wage Distribution

An immediate question of interest is whether state-specific minimum wage regulations have any effect on the labor market. Even more than is the case for the federal law, the enforcement provisions and penalties for non-compliance with state minimum wage regulations are unclear. Some evidence of an effect of the new law is provided by Figure 1, which plots the fractions of workers earning less than \$3.35 per hour and between \$3.35 and \$4.24 per hour in each quarter from

1987-I to 1989-IV. For comparison, the figure also shows the same fractions in a group of states that did not change their minimum wage laws over the 1987–89 period. Ideally, one might have preferred to use neighboring states like Nevada, Oregon, or Washington to form a comparison group for California workers. Following California's lead, however, these states all raised their minimum wage rates in late 1988 or 1989. I have therefore used workers in Arizona, Florida, Georgia, New Mexico, and Dallas–Fort Worth as a comparison group.⁵

The appendix compares the characteristics of workers in California and the other areas. Briefly, the two groups had very similar labor force participation rates, employment-population ratios, and unemployment rates in 1987. The two samples also have roughly comparable gender, age, and education distributions, although the fraction of Hispanic workers is higher in California. Perhaps the biggest difference is in the level of wages, which was 22% higher in California than in the comparison areas in 1987.

Figure 1 shows a sharp decline in the percentage of California workers earning between \$3.35 and \$4.24 per hour after the second quarter of 1988 (that is, after the effective date of the law). The fraction of workers in that wage range in the states without a change in laws shows only a modest downward trend. The relative reduction in California between 1987 and 1989 was 5.2 percentage points. Although not shown in the figure, this change was accompanied by a sharp increase in the percentage of workers reporting exactly \$4.25 per hour: from 0.4% in 1987 to 4.2% in 1989.

In contrast to the effect on the fraction earning \$3.25–4.24 per hour, the increase in the minimum wage had virtually no effect on the fraction earning less than

³ Family income categories are reported on the CPS control card when a household first enters the survey. I have constructed the average income figures in Table 1 by assigning to each interval the mean level of family income in the previous year among currently employed individuals in the March 1988 CPS who report family income in the same interval.

⁴ See Gramlich (1976), for example. Two important differences between the 1988 California wage increase and the 1974–75 increases in the federal minimum considered by Gramlich are the much lower incidence of subminimum pay in California in 1988, and the much wider range of workers affected by the California wage increase.

⁵ I have only used Dallas–Fort Worth, rather than all of Texas, for two reasons. First, during the mid-to-late 1980s, economic conditions in many parts of Texas were affected by the slump in oil prices. Second, by including only those Texans in Dallas and Fort Worth, I increased the relative fraction of urban workers in the comparison sample.

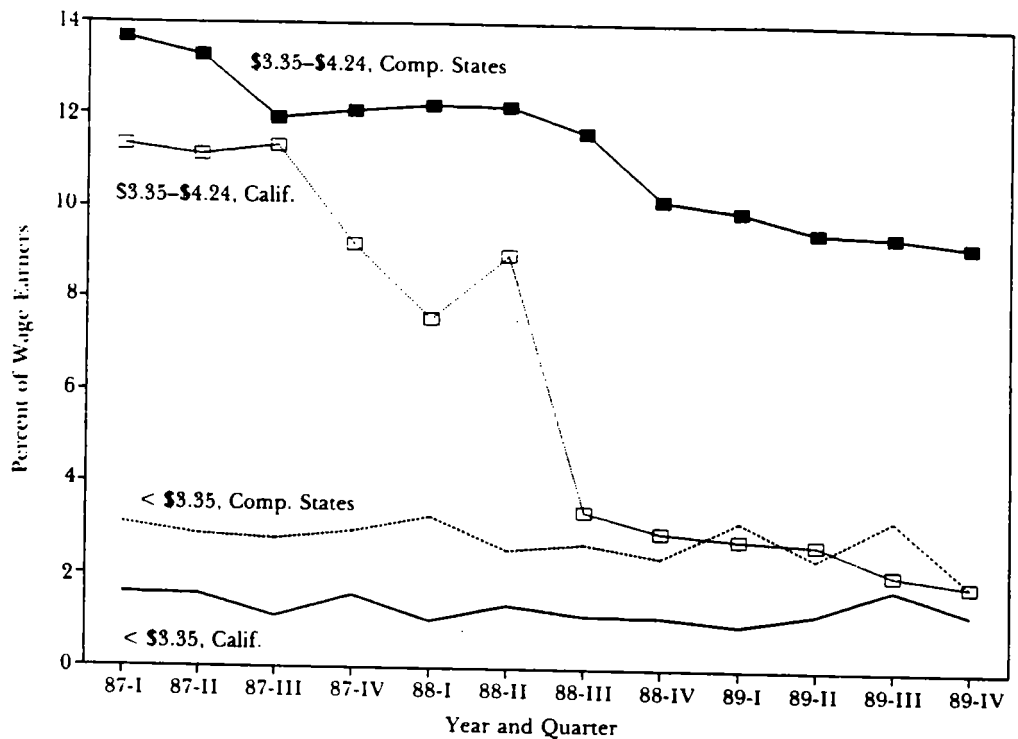


Figure 1. Workers Earning Less Than \$3.35 per Hour and Between \$3.35 and \$4.24 per Hour in California and in Comparison States, 1987-1989.

\$3.35 per hour. This stability implies that the subminimum wage work force (which includes those earning less than \$3.35 and those earning \$3.35 to \$4.24 per hour after July 1988) increased after the effective date of the new law. Using Ashenfelter and Smith's (1979) notion of a noncompliance rate, 31% of all workers with wage rates less than or equal to the minimum wage in 1987 earned less than the minimum. With the rise in the minimum to \$4.25, the noncompliance rate rose to 46%.

One potential explanation for this rise is provided by California law, which permits a 15% lower minimum wage for individuals under 18 years of age and for apprentices and job learners in the first 160 hours of employment. In 1987, the incidence of subminimum pay (less than \$3.35 per hour) was 9% among 16- and 17-year-olds; these workers accounted for 15% of subminimum wage earners. In 1989 the incidence of subminimum pay (less than \$4.25) rose to 17% among 16- and 17-year-olds. Nevertheless, their share of total subminimum

wage employment actually fell to 10%. In fact, the incidence of subminimum pay rose by 200-300% for most groups in the labor force.

A comparison of wage distributions before and after the new law therefore suggests that the rise in the California minimum wage reduced the fraction of California workers earning \$3.35-4.24 per hour by some 5 percentage points, with little or no effect on the fraction earning less than \$3.35 per hour. A majority of the affected workers apparently moved to the new minimum wage level. Assuming this to be true, the minimum wage law raised the wage 15% for 5% of California workers. This estimate is biased upward by any losses of employment that occurred for workers in the affected wage group (see below). It is biased downward to the extent that some workers with 1987 wages in the affected wage range earned more than \$4.25 in 1989, or to the extent that the rise in the minimum affected the earnings of higher-wage workers.

Effects on Employment

A first indication of the employment effects of the rise in the minimum wage comes from a comparison of employment and unemployment trends in California and the country as a whole. From 1987 to 1989 the unemployment rate in California fell from 5.8% to 5.1%. Over the same period the national rate fell from 6.2% to 5.3%. These trends suggest that economic growth in California was similar to or slightly slower than that elsewhere in the United States. The same conclusion emerges from an analysis of the overall employment-population ratio, which gained 1.1 percentage points in California between 1987 and 1989, compared with 1.5 percentage points nationwide.

For California teenagers, however, the pattern is quite different. Between 1987 and 1989 teenage unemployment rates in California fell 3 percentage points (from 16.9% to 13.9%), while the average U.S. rate fell only 1.9 percentage points (from 16.9% to 15.0%). An even stronger relative trend is indicated by the teenage employment-population ratio, which increased 4.1 percentage points in California (from 43.0% to 47.1%) compared to a 2 percentage point increase nationwide (from 45.4% to 47.5%). Since teenagers are the group most directly affected by an increase in the minimum wage, these responses are clearly unexpected.

I have also used published Bureau of Labor Statistics data to evaluate changes in the employment/population ratio of California workers relative to workers in the comparison sample of Arizona, Florida, Georgia, New Mexico, and Dallas-Fort Worth, Texas.⁶ Data for 1985-90 are presented in Table 2. The pre-1987 data allow a simple check on the validity of the comparison sample as a "control group" for California. If the comparison sample is a legitimate control group, there should be no trend in the pre-1987 gap between

California and the comparison sample. This specification test is clearly satisfied for both the overall employment rate and the teenage rate.⁷

Between 1987 and 1989, the gap in the overall employment-population ratio between California and the comparison states increased six-tenths of a percentage point, which may account for up to a percentage point of excess teenage employment growth in California relative to the comparison states.⁸ The actual relative increase in teenage employment from 1987 to 1989 was 4.1 percentage points, however, suggesting a gain in employment following the rise in the minimum wage. The data for 1990 show a return to the earlier patterns, although this year marked the onset of a recession (which was particularly severe in California) and a rise in the federal minimum wage to \$3.80 (on April 1).

The figures in Table 3, derived from CPS microdata, show the effects of the minimum wage on more narrowly defined age-ethnic-education groups. The groups have been selected to yield at least 400 observations per year in California. The first column of the table gives the fraction of workers in each group who earned between \$3.35 and \$4.24 in 1987. This measure of the potential impact of the rise in the minimum wage ranges from 1% for white college graduates to 50% for the two teenage groups (white non-Hispanics and Hispanics). The next columns contain the means of three labor market outcomes in 1987: average hourly earnings, the employment-population rate, and the unemployment rate. Finally, the last three columns give the changes in these outcomes between 1987 and 1989 in California *relative to* the corresponding changes

⁷ If the comparison sample is expanded to include all of Texas, the gap between the overall employment-population ratio in California and the comparison states shows less stability over the 1985-90 period, although the gap in teenage employment rates still drops 3-4 percentage points after 1987.

⁸ As noted in my other article in this issue (Table 3), teenage employment in a state normally responds to aggregate employment in the state with a coefficient slightly greater than 1.

⁶ An important advantage of the published data is that they are derived from the full CPS sample in each month, rather than the 1/4 sample used in the rest of this paper.

Table 2. Employment-Population Ratios for Teenagers and All Workers: California Versus Comparison Areas, 1985-1990.
(Standard Errors in Parentheses)

Sample	Employment-Population Ratio (Percent)					
	1985	1986	1987	1988	1989	1990
<i>All Age 16+:</i>						
California	61.3 (0.4)	62.0 (0.4)	63.1 (0.4)	63.8 (0.4)	64.2 (0.4)	63.1 (0.4)
Comparisons	59.9 (0.3)	60.9 (0.3)	61.7 (0.3)	62.4 (0.3)	62.2 (0.3)	62.2 (0.3)
California - Comparisons	1.4 (0.5)	1.1 (0.5)	1.4 (0.5)	1.4 (0.5)	2.0 (0.5)	0.9 (0.5)
<i>Teenagers:</i>						
California	41.0 (1.3)	41.2 (1.3)	43.0 (1.3)	47.1 (1.3)	47.1 (1.3)	41.4 (1.3)
Comparisons	45.7 (1.2)	47.0 (1.2)	47.0 (1.2)	46.5 (1.2)	47.0 (1.2)	45.2 (1.2)
California - Comparisons	-4.7 (1.8)	-5.8 (1.8)	-4.0 (1.8)	0.6 (1.8)	0.1 (1.8)	-3.8 (1.8)

Notes: Employment-population ratios are taken from U.S. Department of Labor, Bureau of Labor Statistics, "Geographic Profiles of Employment and Unemployment," 1985-1990 editions. Data for comparison areas are a weighted average of data for Arizona, Florida, Georgia, New Mexico, and Dallas-Fort Worth, using 1988 population counts as weights. Standard errors are based on published sampling errors for 1989.

for the same groups in the comparison states.⁹ These simple "differences-in-differences" measure the excess changes that occurred in California as a result of the rise in the minimum wage (or other unspecified factors).

Among the 15 groups in the table, only white and Hispanic teenagers and 20-24-year-old Hispanics show significantly different relative wage growth in California and the comparison areas. As might be expected, these three groups enjoyed substantial relative wage gains in California. More difficult to explain are the relative increases in *employment* for the three groups.

Although the differences-in-differences in Table 3 are imprecise, one can ask whether there is any systematic relation between the fraction of a group earning \$3.35-4.24 per hour in 1987 and the relative changes in the labor market outcomes for that group. The answer for wages is yes: a simple (unweighted) regres-

sion of the difference-in-differences of wages on the fraction of workers in the group earning \$3.35 to \$4.24 per hour in 1987 yields a coefficient of 0.32, with a standard error of 0.10.¹⁰ The magnitude of this coefficient suggests that the rise in the minimum wage did more than simply "top up" the wages of those who would have earned between \$3.35 and \$4.25 in the absence of the law (each of whom would receive a 15% wage increase, on average, leading to a coefficient of 0.15). One explanation is that concern over relative wages leads to a "spillover" effect for workers who previously earned more than the new minimum (see Grossman [1983] for an earlier analysis). Given the imprecision of the wage data, however, it is difficult to test this hypothesis more carefully.

In contrast to conventional predictions, groups with a higher fraction of low-wage workers do not appear to have suffered any relative losses in employment. Indeed, the correlation between the difference-in-

⁹ Owing to the low number of Asians outside California, the sample sizes of the "other non-Hispanics" groups are too small for a meaningful analysis in the comparison sample.

¹⁰ The R-squared of the regression is 0.44. The only significant outlier is the group of 16-24-year-old blacks.

Table 3. Wages, Employment, and Unemployment Rates for Various Groups: California, 1987, and California - Comparisons, 1987 to 1989.
(Standard Errors in Parentheses)

Group	California, 1987				Differences-in-Differences ^a		
	Percent \$3.35-4.24	Mean Wage	Employ. Rate	Unemp. Rate	Mean Wage	Employ. Rate	Unemp. Rate
<i>White Non-Hispanics:</i>							
Age 16-19	52.1	4.69 (0.10)	48.2 (1.5)	13.9 (1.4)	9.6 (4.3)	5.9 (3.1)	0.2 (2.6)
Age 20-24, Educ. ≤ 12	13.8	7.65 (0.19)	73.5 (1.6)	7.9 (1.1)	1.3 (5.8)	-0.9 (3.2)	-0.7 (2.2)
Age 20-24, Educ. > 12	14.0	7.53 (0.16)	77.0 (1.6)	5.0 (0.9)	0.7 (4.8)	2.0 (3.1)	-0.6 (1.8)
Age 25+, Educ. < 12	14.6	9.17 (0.28)	46.3 (1.5)	9.3 (1.2)	9.5 (7.0)	-2.3 (2.8)	-3.7 (1.9)
Age 25+, Educ. = 12	4.5	10.77 (0.13)	65.7 (0.8)	4.2 (0.4)	-2.3 (2.4)	1.4 (1.4)	-0.3 (0.7)
Age 25+, Some College	3.2	12.35 (0.14)	75.1 (0.8)	3.3 (0.4)	-0.3 (2.5)	-0.4 (1.5)	-0.3 (0.7)
Age 25+, Educ. ≥ 16	1.0	16.45 (0.18)	83.4 (0.6)	2.3 (0.3)	0.5 (2.4)	0.5 (1.2)	-0.8 (0.5)
<i>Black Non-Hispanics:</i>							
Age 16-24	27.0	6.93 (0.37)	46.9 (2.6)	21.7 (2.8)	-8.6 (8.4)	-0.8 (5.0)	1.5 (5.4)
Age 25+, Educ. ≤ 12	6.8	9.53 (0.29)	53.5 (2.1)	10.1 (1.6)	-2.9 (5.1)	4.5 (3.5)	-1.2 (2.6)
Age 25+, Educ. > 12	1.4	12.35 (0.33)	79.4 (1.7)	6.4 (1.1)	2.7 (6.1)	5.7 (3.1)	-2.5 (1.9)
<i>Hispanics:</i>							
Age 16-19	52.6	4.36 (0.11)	37.7 (2.1)	21.4 (2.6)	23.1 (8.6)	5.8 (4.8)	-4.9 (5.4)
Age 20-24	26.2	5.87 (0.12)	69.8 (1.8)	10.3 (1.3)	12.4 (5.3)	1.2 (3.9)	1.4 (2.9)
Age 25+, Educ. < 12	22.9	6.49 (0.11)	61.3 (1.2)	8.5 (0.8)	3.3 (5.5)	-0.1 (2.8)	-0.7 (2.1)
Age 25+, Educ. = 12	7.8	8.67 (0.18)	71.7 (1.5)	6.1 (0.9)	4.1 (4.8)	3.5 (3.1)	-1.8 (1.9)
Age 25+, Educ. > 12	3.5	12.20 (0.30)	82.6 (1.5)	4.2 (0.8)	-7.0 (5.3)	3.6 (2.9)	-1.8 (1.6)
<i>Other Non-Hispanics:</i>							
Age 16-24	23.7	6.10 (0.23)	48.8 (2.3)	10.5 (1.9)	—	—	—
Age 25+, Educ. ≤ 12	21.1	7.44 (0.24)	58.6 (1.9)	4.9 (1.1)	—	—	—
Age 25+, Educ. > 12	3.1	13.04 (0.28)	81.2 (1.2)	3.2 (0.6)	—	—	—
All (Age 16-68)	10.8	10.69 (0.06)	68.4 (0.3)	5.8 (0.2)	-1.8 (1.2)	0.8 (0.6)	-0.6 (0.4)

Note: "Other Non-Hispanics" include Asians and Native Americans.

^a Change between 1987 and 1989 for outcome in California minus corresponding change for outcome in comparison areas. The difference-in-differences of mean wages represents the difference in percentage changes of mean wages.

differences in employment rates and the fraction of workers earning \$3.34–4.25 in 1987 is 0.3. This positive correlation is due to the large increases in relative employment registered by the two teenage groups. These comparisons thus confirm the conclusion from the published data in Table 2: the rise in the minimum raised the wages of low-wage workers, with no evidence of adverse employment effects.

Effects of the California Minimum Wage on Teenagers

In light of the findings in Tables 2 and 3, in this section I present a more detailed analysis of the experiences of 16–19-year-old workers in California and the comparison areas. Table 4 presents 1987 and 1989 data for teenagers in California and

the comparison areas together with the differences-in-differences of the various labor market outcomes. The first three rows of the table give information on the wage distributions of teenage workers. The fraction of California teenagers earning \$3.35–4.24 per hour declined dramatically between 1987 and 1989. Much of this change was associated with a reduction in the number of workers earning the old minimum wage and a corresponding increase in the number earning the new minimum rate.

These relative changes were associated with a 10% relative increase in mean wages for California teenagers. Hours per week of employed teenagers also increased slightly in California relative to the comparison group, leading to an 11% relative increase in usual weekly earnings.

Table 4. Characteristics of Teenagers in California and Comparisons Areas, 1987 and 1989 (Standard Errors in Parentheses)

Characteristic	California Teens		Comparison Teens		Difference in Differences ^a
	1987	1989	1987	1989	
Percent with Wage \$3.35–4.24	52.0 (1.8)	8.5 (1.1)	55.3 (1.6)	48.1 (1.6)	–36.5 (3.1)
Percent with Wage = \$3.35	15.5 (1.3)	0.7 (0.3)	16.1 (1.2)	11.3 (1.0)	–10.1 (2.1)
Percent with Wage = \$4.25	1.6 (0.5)	22.5 (1.7)	3.3 (0.6)	4.4 (0.7)	19.8 (1.9)
Mean Log Wage	1.46 (0.01)	1.62 (0.01)	1.40 (0.01)	1.46 (0.01)	0.10 (0.02)
Variance of Log Wages	0.109 (0.010)	0.109 (0.015)	0.086 (0.008)	0.090 (0.009)	–0.004 (0.022)
Usual Hours per Week	26.2 (0.4)	26.7 (0.5)	27.9 (0.4)	28.1 (0.4)	0.3 (0.8)
Usual Earnings per Week (\$)	125.6 (3.5)	149.8 (4.3)	121.3 (2.4)	132.1 (2.6)	13.4 (6.6)
Enrollment Rate (%)	66.5 (1.0)	63.1 (1.3)	57.2 (1.0)	59.2 (1.0)	–5.4 (2.2)
Employment Rate (%)	42.0 (1.1)	47.4 (1.3)	46.4 (1.0)	46.1 (1.1)	5.6 (2.3)
Labor Force Part. Rate (%)	50.5 (1.1)	54.2 (1.3)	56.9 (1.0)	54.8 (1.1)	5.9 (2.3)
Unemployment Rate (%)	16.7 (1.2)	12.6 (1.2)	18.5 (1.1)	15.9 (1.1)	–1.5 (2.3)
Employment Rate of Enrollees ^b (%)	34.2 (1.3)	39.2 (1.6)	37.0 (1.3)	36.5 (1.3)	5.5 (2.8)
Sample Size	2,032	1,381	2,354	2,206	–

Note: Samples include all individuals age 16–19.

^a Change in outcome between 1989 and 1987 for California teens minus corresponding change for comparison area teens.

^b Employment rate among teenagers enrolled in school.

As shown in Tables 2 and 3, these wage and earnings increases were accompanied by an increase in teenage employment-population ratios. Most of this increased employment represented a net addition to the labor force: teenage unemployment rates registered only a small net decline.

The relative changes in employment between California and the comparison states are further illustrated in Figure 2, which plots quarterly employment rates from 1987 to 1989 for the two groups of teenagers. Employment rates were uniformly higher for the comparison group in 1987. Starting in 1988, however, the rates are much closer together. Because of the relatively large sampling errors and the volatility of the measured rates, it is difficult to identify a clear "turning point." There is no evidence, however, of the 3% to 8% decline in employment predicted by the estimates in Brown, Gilroy, and Kohen (1982) or Neumark and Wascher (1992).

A broader perspective on the change in employment for California teenagers is provided by Figure 3, which plots 1989 teenage employment-population ratios for

all 50 states against their corresponding rates in 1987. (These data are taken from the same published source as the data in Table 2.) I have highlighted the California data as well as the data for other states that raised their minimum wage rates between 1987 and 1989. The average employment-population ratio increased 2% across all states, compared with an increase of 4.1% in California and no net change in the comparison areas. These figures suggest that the narrower comparison of teenagers in California with those in Arizona, Florida, Georgia, New Mexico, and Dallas-Fort Worth may somewhat overstate the relative increase in the teenage employment rate in California. Whatever the comparison group, however, there is no apparent decline in employment among California teenagers.

A long-standing question in the minimum wage literature is whether changes in the minimum wage affect teenage school enrollment patterns (see, for example, Ehrenberg and Marcus 1980). The difference-in-differences in Table 4 suggests that relative enrollment rates fell in

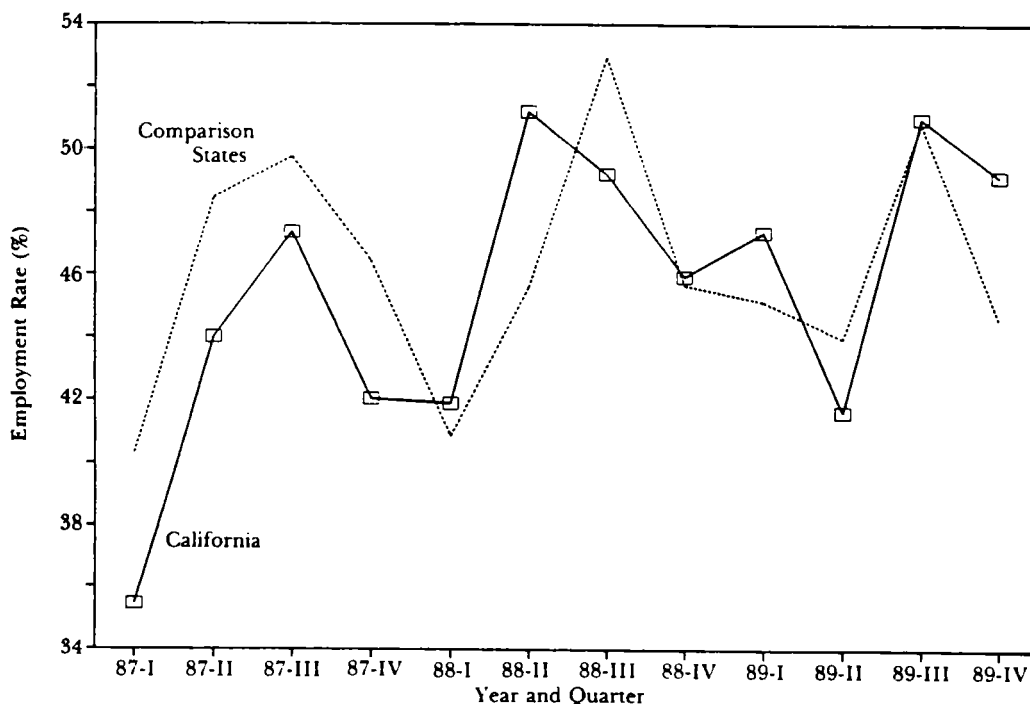


Figure 2. Teenage Employment Rates in California and Comparison States, 1987-1989.

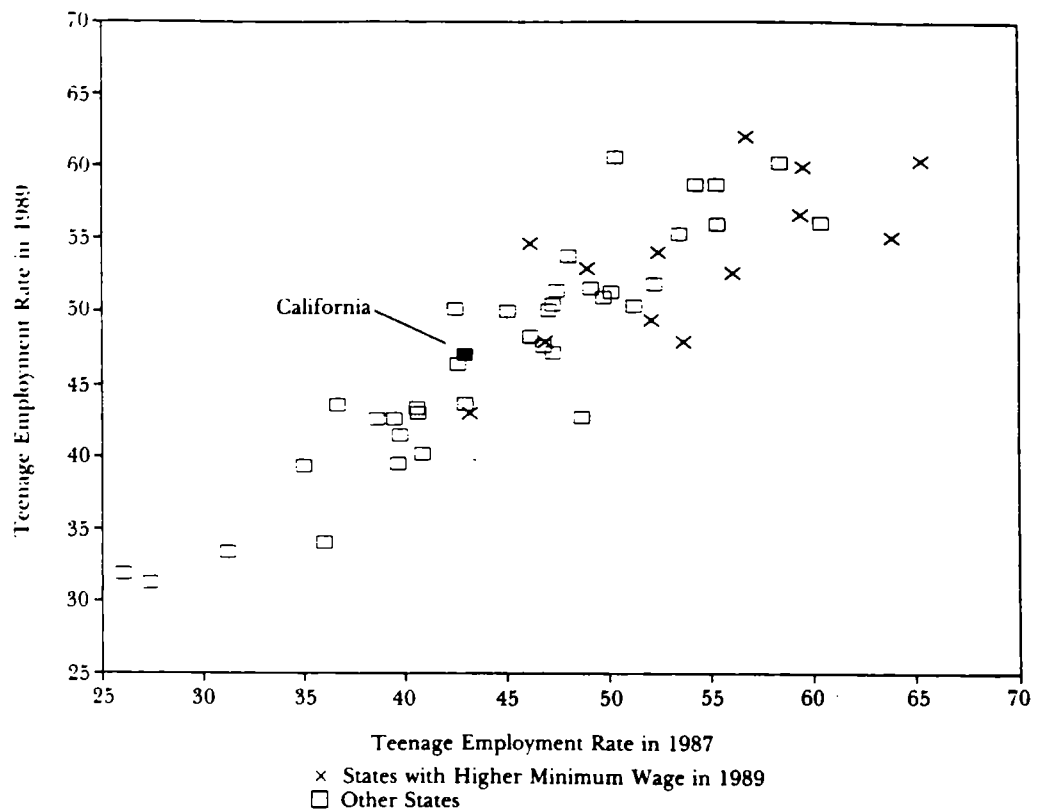


Figure 3. Teenage Employment-Population Rates in the 50 States and the District of Columbia: 1989 Rates Plotted Against 1987 Rates.

California after the rise in the minimum wage. Interestingly, these enrollment changes were not directly associated with the relative growth in California employment. Indeed, as shown in the penultimate row of the table, the relative increase in employment rates among enrolled students was about as large as the overall increase.

The enrollment measures in Table 4 are based on averages over all 12 months of the year, and therefore combine traditional school attendance, summer school, and other programs. A more conventional procedure is to measure enrollment in the fall: a difference-in-differences in enrollment rates from September to December shows a slightly smaller relative decline in California (-3.8% , with a standard error of 4.0). Although imprecisely estimated, this effect is still relatively large. To check the magnitude of the enrollment change, I collected administrative data on high

school and college enrollment in California and the comparison states over the 1987–89 period. Combining public high school enrollment and total undergraduate enrollment in all types of higher education, California enrollment fell 2 percentage points between fall 1987 and fall 1989.¹¹ Similar enrollment measures in the comparison states rose 1.3 percentage points. This divergence is roughly consistent with the patterns in Table 4.¹²

The simple means and differences in

¹¹ The data on public high school enrollment are from U.S. Department of Education, *Digest of Education Statistics 1991*, Table 39. The undergraduate enrollment data are from the same source, Table 185.

¹² Changes in total enrollment and enrollment rates are only strictly comparable if population growth rates are similar. Data in U.S. Bureau of the Census (1990) show slightly faster population growth for individuals age 15–24 in California than in the comparison states over the 1987–89 period.

Table 4 make no adjustment for the demographic characteristics of the teenagers actually sampled in the CPS. Although in principle the CPS sample is representative of the population, it is possible that adjustments for measured characteristics such as age, gender, and ethnicity could lead to more stable and precise estimates of the relative changes between California and the comparison states. These adjustments are easily accomplished in a regression framework by pooling the samples for California and the comparison areas in the two years, and including various control variables as well as indicators for the four underlying samples.

Using that procedure, I measured the relative changes in employment probabilities, wages, and enrollment probabilities between 1987 and 1989, controlling for age (four single age categories), gender, ethnicity (four categories), month of the sample, and location (indicators for four major cities in California and the individual states in the comparison sample). Controlling for these characteristics, the relative changes in the employment rate and the mean log wage rate are essentially identical to the unadjusted differences-in-differences. (The regression-adjusted standard errors are also very similar to the unadjusted standard errors in Table 4.) The implied relative change in the enrollment rate is -3.1% , slightly smaller than the unadjusted difference-in-differences and comparable to the relative change in fall enrollments. On balance, the addition of control variables does not affect the conclusions in Table 4.

The data in Table 4 also make no distinction between individuals age 18 and 19, who are legally covered by the \$4.25 minimum wage in California, and individuals age 16 and 17, who are covered by a \$3.60 youth subminimum. If employers can hire 16- and 17-year-olds for \$3.60, and must pay \$4.25 for workers over age 18, it is conceivable that the rise in the minimum generated a shift in demand away from older teenage workers and in favor of younger ones.

To check that possibility, I computed the means for 16–17-year-olds and 18–19-

year-olds separately. The differences-in-differences of log wages and employment rates show a larger relative wage gain for the younger teens (15%, versus 6% for 18–19-year-olds) and smaller relative employment growth (3 percentage points, versus 7). Although these results rule out any widespread substitution of younger for older teenagers, it should be noted that the youth subminimum wage is apparently only rarely used. There is no evidence of a spike in the wage distribution of 16–17-year-olds in California at the subminimum, nor was there a much higher fraction of 16–17-year-olds than of 18–19-year-olds earning less than \$4.25 per hour in 1989. Despite the legal provision of a youth subminimum wage, labor market participants seem to view the adult minimum as the relevant one for all workers.¹³

Effects on Retail Trade

Almost one-half of California workers whose 1987 wage rates were between the old federal minimum and the new state minimum were employed in retail trade. The experiences of retail trade are especially interesting because the Industrial Wage Commission initially set a subminimum for tipped employees in the restaurant industry. This provision was later overruled, leaving the state with a 20% higher-than-intended minimum in a large sector of the retail industry. One might expect the adverse consequences of an unintended age floor to be larger than the effects of a deliberately chosen rate.

Table 5 summarizes the characteristics of retail trade employees in California and the comparison sample in 1987 and 1989. There was a substantial relative reduction in the fraction of California workers earning between \$3.35 and \$4.24 after the new minimum wage took effect. This change was associated with a 5–7% relative increase in hourly and weekly earnings

¹³ Katz and Krueger (1990) present survey evidence for the fast-food industry in Texas that suggests that only 3% of employers use the subminimum provision of the federal law.

Table 5. Characteristics of Workers in Retail Trade: California and Comparison Areas, 1987 and 1989.

(Standard Errors in Parentheses)

Characteristic	California		Comparison Areas		Difference in Differences ^a
	1987	1989	1987	1989	
<i>Percentage of Workers with:</i>					
Wage < \$3.35	1.7 (0.3)	1.2 (0.3)	7.1 (0.5)	6.6 (0.5)	-0.1 (0.8)
Wage = \$3.35	10.6 (0.7)	0.7 (0.2)	7.1 (0.5)	4.7 (0.4)	-7.6 (1.0)
Wage Between \$3.35 and \$4.24	30.8 (1.1)	4.7 (0.5)	30.1 (0.9)	24.2 (0.8)	-20.2 (1.7)
Wage = \$4.25	0.8 (0.2)	14.7 (0.9)	1.7 (0.3)	2.8 (0.3)	12.7 (1.0)
<i>Other Characteristics of Workers:</i>					
Mean Log Wage	1.80 (0.01)	1.90 (0.01)	1.67 (0.01)	1.72 (0.01)	0.05 (0.02)
Usual Hours/Week	34.9 (0.2)	35.0 (0.3)	36.7 (0.2)	36.8 (0.2)	0.1 (0.5)
Usual Earnings/ Week (\$)	261.1 (5.0)	291.2 (6.3)	241.5 (4.0)	252.4 (3.7)	19.2 (9.8)
Percent Age 16-19	16.7 (0.7)	16.4 (0.9)	15.7 (0.6)	16.1 (0.6)	-0.7 (1.4)
Percent Age 20-24	19.6 (0.8)	19.0 (0.9)	18.1 (0.7)	17.4 (0.6)	0.1 (1.5)
Percent Age 16-24 & in School	14.9 (0.7)	15.7 (0.8)	12.7 (0.6)	12.5 (0.6)	1.0 (1.4)
Percent Female	49.2 (1.0)	46.4 (1.1)	51.0 (0.9)	49.9 (0.9)	-1.6 (1.9)
Percent Hispanic	20.6 (0.8)	24.9 (1.0)	11.9 (0.6)	11.6 (0.6)	4.5 (1.5)
Sample Size	2,521	1,889	3,394	3,388	-

Note: Samples include individuals age 16-68 employed in retail trade industry.

^a Change in outcome between 1989 and 1987 for California workers minus corresponding change for comparison workers.

among California workers. There were no corresponding changes in weekly hours or in the age or gender composition of retail employment. The one significant relative demographic change is an increase in the fraction of Hispanic workers in California retailing. Contrary to expectations, none of these comparisons suggest a substitution away from less-skilled workers.

I have also computed the same comparisons for employees of eating and drinking establishments. These workers constitute 30% of all employees in retail trade and 50% of those who earned between \$3.35 and \$4.24 in 1987. The comparisons show a 42 percentage point relative decline in the fraction of restaurant workers earning between \$3.35 and \$4.24 per

hour, a 31 percentage point relative increase in the fraction earning exactly \$4.25 per hour, and an 8% relative increase in mean log wages. As for the entire retail trade industry, there is no indication of skill-upgrading, at least as measured by changes in the age, gender, or ethnic composition of the work force for eating and drinking establishments.

The CPS microdata show significant relative wage gains for retail trade and restaurant workers following the rise in the California minimum wage. To measure any corresponding changes in employment, I have assembled establishment-level data from the unemployment insurance system in Table 6. One minor difficulty with these data is that employ-

Table 6. Employment in Retail Trade and Eating and Drinking, California. Comparison Areas, and the Entire Country, 1984-90.

Sample	Employment Relative to 1985-87 Average:						
	1984	1985	1986	1987	1988	1989	1990
<i>All Retail Trade:</i>							
California	0.93	0.97	1.00	1.03	1.07	1.10	1.11
Comparisons	0.92	0.97	1.00	1.03	1.05	1.09	1.10
All U.S.	0.93	0.97	1.00	1.03	1.06	1.09	1.10
<i>Eating and Drinking Establishments:</i>							
California	0.92	0.97	1.00	1.04	1.07	1.08	1.10
Comparisons	0.90	0.96	1.00	1.04	1.07	1.10	1.14
All U.S.	0.92	0.97	1.00	1.04	1.07	1.09	1.11

Notes: In this table only, the comparison areas are Arizona, Florida, Georgia, New Mexico, and all of Texas. Data are from U.S. Department of Labor, Bureau of Labor Statistics, "Employment and Wages—Annual Averages," 1984-1990 editions.

ment counts for Dallas-Fort Worth are unavailable. In this table the comparison sample therefore includes all of Texas.

For retail trade as a whole, the establishment-level data show very similar trends in employment growth in California and the comparison areas between 1984 and 1987. This pattern continues after 1988, with slightly stronger employment growth in California between 1987 and 1989. For eating and drinking establishments, the 1984-88 data suggest a stronger trend in employment growth in the comparison states than in California or the country as a whole. From 1987 to 1989 employment growth in California was 2.0 percentage points lower than in the comparison sample, and 1 percentage point lower than in the United States. Taking account of the stronger growth rate in eating and drinking employment in the comparison states before 1988, the 1987-89 data suggest a 1 percentage point relative employment loss in California. This finding may reflect an adverse effect of the minimum wage, but given the absence of any effects for retail trade as a whole or for low-wage demographic groups, it may instead simply reflect longer-run trends.

The retail trade industry, and eating and drinking establishments in particular, are characterized by a relatively high fraction of unskilled labor input. In light of the wage increases generated by the rise in the minimum wage, it is interesting to examine some industry price data. Figure 4 presents 1987 and 1989 price indexes for 24 major

cities on the cost of food away from home. The Bureau of Labor Statistics compiles the data for three California cities: Los Angeles, San Diego, and San Francisco. The figure also shows the fitted regression line that predicts the 1989 index for each city based on its 1987 value. The 1989 prices for Los Angeles and San Francisco are very close to their predicted values, given the pattern of price changes in other cities. Prices in San Diego, on the other hand, are some 5% higher than predicted.

This pattern coincides with a larger wage increase observed for San Diego teenagers than for teenagers elsewhere in the state. Unfortunately, the sample sizes for individual cities in the CPS are small, and some city-specific variation can be expected from the sample design of the CPS. Thus, it is very difficult to obtain reliable estimates of teenage wages by city. Although it may be tempting to attribute the San Diego price increases to the relatively larger wage increases there, the absence of a statewide pattern of increases for the price of food away from home is still a puzzle.

Some further evidence on restaurant prices is available from a survey conducted in over 250 cities nationwide by local affiliates of the American Chamber of Commerce Researchers Association (ACCRA). Among the prices collected by ACCRA are the prices of quarter-pound hamburgers. (See ACCRA, various years.) Data are available for seven California cities (Bakersfield, Fresno, Los Angeles, Riverside, Sacramento, San Diego, and

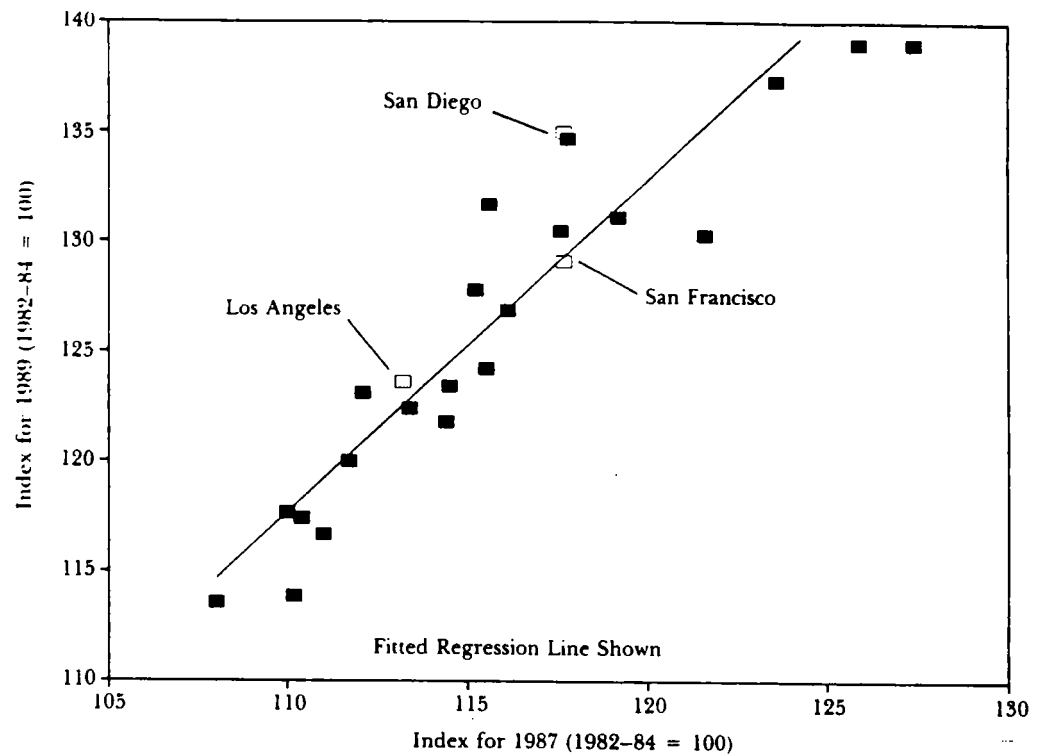


Figure 4. The Cost of Food Away from Home in 24 Major Cities: 1989 Index Plotted Against 1987 Index.

San Jose) and several cities in the comparison area (including Phoenix, Tucson, and Dallas). A comparison of the averages of quarterly prices for 1987 and 1989 shows that three California cities (Riverside, Sacramento, and San Diego) had slightly faster price growth than other cities in the ACCRA sample. The remaining California cities, and Phoenix, Tucson, and Dallas, all show little change relative to the all-cities average. Neither the BLS data nor the ACCRA data show a pattern of statewide increases in California restaurant prices between 1987 and 1989.

Interpretation of the Findings

I find no empirical support for the conventional prediction that economists make regarding the employment effect of minimum wages. Although the rise in the minimum wage in California raised the earnings of low-wage workers, it does not seem to have significantly reduced employment, even in the retail trade indus-

try. For teenagers the changes following the rise in the minimum wage are particularly striking: hourly and weekly earnings rose by 10% while the employment-population ratio rose by 4%. The observed employment changes contrast with predictions based on aggregate time series studies, which imply a 3-8% reduction in teenage employment following a 27% increase in the minimum wage.

These findings are inconsistent with a conventional competitive model of the low-wage labor market. An alternative model that is often suggested in theoretical discussions of the minimum wage is one in which employers of low-wage workers have market power and act as monopsonistic purchasers of labor (see, for example, Stigler 1946). In this model the imposition of a binding wage floor can lead to an increase in wages, an increase in employment, an increase in industry output, and a reduction in industry selling prices. In my opinion, the experiences following the rise in the California minimum wage suggest that this

(Monopsonistic) Alternative Model (Minimum Wage) ↑

model or other alternative models deserve more careful scrutiny.

Whether a monopsonistic model provides the correct interpretation of events in the labor market for California teenagers between 1987 and 1989 is of obvious importance for economists' interpretation of labor market behavior and policy. Economists have been reluctant to admit the possibility of market power in the labor market, owing to the mobility of workers and to the fact that most labor markets involve large numbers of relatively small employers.¹⁴ It seems unlikely that a monopsonistic outcome arises from the market power of an individual employer. Nevertheless, when teenage workers are asked what wage rate they would require to move to a similar job in the same area, they name a wage 26% higher than their current wage.¹⁵ This

fact suggests that low-wage employers may enjoy some degree of monopsony power.

An alternative view is that the California labor market was "trapped" in an equilibrium with excess demand for labor—perhaps because employers had historically viewed the federal minimum as a binding wage floor and failed to adjust to the decline in its real value over the 1980s. Given the low wages paid by other firms, and a general shortage of labor, no individual employer had an incentive to offer a (marginally) higher wage to recruit new workers. Employers continued to post vacancies, however, and continued trying to recruit new workers without raising the wages of their existing work force.

Another View

More research will be needed before economists embrace non-competitive models of the labor market. In the meantime, evidence from the study of California's experiences should temper any confident assessment of the welfare economics of minimum wages.

¹⁴ One exception is the market for highly specialized labor in a particular geographic location. Sullivan (1989) examines the market for registered nurses and finds evidence of exploitable market power at the hospital level. Ransom (1990) examines the market for academic faculty and interprets the negative relation between wages and length of service as a monopsony effect.

¹⁵ This estimate is derived from a sample of 1,028 employed teenagers in the 1982 wave of the National Longitudinal Survey of Youth who report a hypo-

thetical hourly wage required to move to a similar job at a different employer. The standard error on the estimated premium is 0.01.

Appendix
Characteristics of California and Comparison Samples, 1987

Characteristic	California	Comparisons
Mean Age	37.5	38.3
Percent Female	50.9	51.5
Percent Age 16–19	8.7	8.7
Average Education (Years)	12.6	12.4
Percent College Grads	21.4	17.7
Percent White Non-Hispanic	63.1	70.7
Percent Black Non-Hispanic	6.7	15.5
Percent Hispanic	21.2	11.7
Percent Asian and Other Non-Hispanic	8.9	1.9
Percent Married	55.5	58.0
Percent in Central City	37.0	26.8
Percent Union Members	19.5	7.8
Percent Government Wkrs.	13.6	13.6
Percent Self-Employed	8.5	6.9
Mean Wage (\$/Hour)	10.69	8.77

(Continued)

Appendix (Continued)

Characteristic	California	Comparison
Industry Distribution:		
Agriculture	3.4	2.7
Construction	10.3	12.3
Manufacturing	14.4	10.4
Transportation, Communication, Utilities	6.6	7.3
Trade	23.1	25.2
Finance, Insurance, Real Estate	7.2	7.4
Services	34.0	32.8

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NEW MINIMUM WAGE RESEARCH: SYMPOSIUM INTRODUCTION

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AFTER almost a decade of "benign" neglect, the *Fair Labor Standards Act* (FLSA) was amended in November 1989.¹ The amendments increased the federal minimum wage from \$3.35 to \$3.80 an hour, effective April 1, 1990, and then to \$4.25 an hour, effective April 1, 1991. Among the amendments' other provisions was the adoption of a subminimum or training wage for teenagers, which allows employers to pay teenagers 85% of the prevailing minimum wage during their first six months of employment. The latter provision, however, contains a "sunset" clause; unless legislation is passed to extend the subminimum wage, it will end on March 31, 1993.

The *Fair Labor Standards Amendments of 1989* also require the Secretary of Labor to report to Congress no later than March 1, 1993, on the extent to which employers have made use of the subminimum wage, the impact of the subminimum wage on employment opportunities for both experienced and inexperienced workers, and its impact on the nature and duration of training offered to workers. Together, the sunset clause, the reporting requirement, and the fact that the federal minimum wage has been pegged at \$4.25 an hour since April 1, 1991, almost guarantee that proposals to amend the FLSA will appear in Congress in the near future.

The passage of the 1989 FLSA amendments stimulated a new wave of research

on the effects of minimum wage legislation, and five of the resulting papers are gathered together in this symposium. Four of these are revisions of papers that were presented at the ILR-Cornell Institute for Labor Market Policies/Princeton University Industrial Relations Section Conference, "New Minimum Wage Research," which was held at Cornell University on November 15, 1991.² These papers, as well as the fifth paper, which was contributed by one of the conference participants after the conference was concluded, have all been subject to a refereeing process. I hope that assembling these papers here will enhance their usefulness in future policy debate.

Most, but not all, prior research on the employment effects of minimum wage changes made use of either aggregate time-series data or state cross-section data. The time-series studies exploited the fact that the minimum wage varies over time relative to other wages both because of changes in the minimum wage and because of changes in other wages. The cross-section studies exploited the fact that, although the federal minimum wage is constant across states at a given time, minimum wage levels under state laws and

² The conference was organized by Alan Krueger of Princeton and myself. It was attended by a total of 35 individuals spanning academia, liberal-oriented (Economic Policy Institute) and conservative-oriented (American Enterprise Institute) Washington "think-tanks," federal executive and legislative staffs, and several state agencies. One of the purposes of the conference was to honor Donald Cullen for his years of service to the profession as Editor of the *Industrial and Labor Relations Review*. Coincidentally, Cullen himself was an early contributor to the debate over minimum wage laws (see Cullen 1961).

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¹ *Fair Labor Standards Amendments of 1989*, Public Law 101-157 [HR 2710], November 1989.

their coverage vary across states, as do the prevailing values of other wages. On balance, these prior studies concluded that, *ceteris paribus*, a 10% increase in the minimum wage would be associated with a 1% to 3% decrease in teenage employment (Brown 1988).

Four of the symposium papers reexamine the issue of employment effects of minimum wage changes, and the authors of these papers have taken seriously Richard Freeman's advice that labor economists should search for natural experiments and use these to evaluate hypotheses (Richard Freeman 1989:x). Lawrence Katz and Alan Krueger survey fast-food restaurants in Texas that were in business both prior to and after the 1991 change in the federal minimum wage law. They ask if those firms most likely to be affected by the minimum wage increase (those that employed relatively more low-wage workers) suffered the greatest employment losses after the increases. David Card's first contribution uses *Current Population Survey* data to see if teenage employment declined more after the 1990 federal minimum wage increase in states in which relatively more teenagers should have been affected by the change. This paper exploits the fact that prior to the 1990 change in the federal minimum wage, the fraction of teenagers earning between \$3.35 and \$3.80 an hour varied across states from less than 10% to more than 50%.

Card's second paper focuses on the July 1988 increase in the California state minimum wage from \$3.35 to \$4.25 an hour, which predated the increase in the federal minimum. He contrasts changes in teenage employment in California with changes in teenage employment in "similar" nearby states that did not change their state minimum wage rates at the same time. Finally, David Neumark and William Wascher employ panel data that take account of changes in state minimum wage levels and coverage during the 1977-78 period to analyze the employment effects of minimum wage changes.

Quite dramatically, Katz and Krueger's paper and both of Card's papers find no

evidence that increases in minimum wages cause employment declines. In contrast, Neumark and Wascher do find negative employment effects for some of their econometric specifications, and they argue that these specifications are the preferred ones in their paper.

① How can one reconcile these divergent findings? At least three possible explanations exist. First, Katz and Krueger acknowledge they are analyzing employment changes at firms that survive, so their analysis can tell us nothing about the effects of the minimum wage increase on the probability that an established firm survives or the probability that a new firm is created.³ Increases in the minimum wage may decrease both "survival" and "creation" probabilities and adversely influence employment via these routes.

② Second, Neumark and Wascher's data span an earlier period of time than the data used in the other studies. During most of the earlier period, the value of the minimum wage relative to both prices and other wages was higher than it was during the period the other studies span, as was the proportion of workers earning near or at minimum wage rates. The magnitude of the employment loss caused by a given percentage increase in the minimum wage may well depend on the initial relative value of the minimum wage, as well as the number of workers earning at or near the minimum wage.

③ Third, Neumark and Wascher present evidence that estimates of minimum wage effects depend crucially on the specific statistical model used. For example, when they apply the statistical approach Card used in both of his papers to their own data and preferred equations, they find (similarly to Card) no statistically significant evidence of negative effects of minimum wages on employment. They argue, however, that some specification tests they conduct (relating to the possibility that lagged minimum wage effects exist) suggest that their own statistical approach, which did show negative effects

³ Cullen (1961:10) noted this same point.

Katz + Krueger / Card
no employment
declines

Neumark + Wascher
negative employment
effects

of minimum wages on employment, is preferable.

Although ultimately it is up to the reader to decide whose estimates are to be preferred, it is significant that none of the studies suggest that at current relative values of the minimum wage, large disemployment effects would result from modest future increases in the minimum wage—increases up to, say, 10%. In this sense, all the findings are very consistent.

The symposium papers also address a variety of other issues. For example, Ralph Smith and Bruce Vavrichek focus on the earnings mobility of workers who, in an initial survey, were earning the minimum wage. Data from the *Survey of Income and Program Participants* during the mid-1980s suggest that although most of these workers who were still employed a year later were earning higher wages—typically almost 20% more—a substantial fraction remained “trapped” at the minimum wage. These latter people, who tend to be part-time workers, older workers, and workers without high school diplomas, are the workers who are most likely to benefit from minimum wage increases, although one suspects they are also the group whose employment might be most adversely affected.

To take two other examples, several papers address issues relating to subminimum wage laws. Katz and Krueger find that less than 5% of the employers in their fast-food sample took advantage of the new federal subminimum provision. In

contrast, Neumark and Wascher's analysis, which takes account of subminimum wage provisions in state minimum wage laws, yields some evidence that these provisions moderate the disemployment effects of minimum wage increases. Several papers also address the effects of minimum wage increases on educational decisions. No evidence is found either by Neumark and Wascher or by Card that such increases adversely affect aggregate school enrollment rates.⁴

These papers do not exhaust the set of research questions to which policy-makers need answers. For example, we learn little from them as a group about the income distribution consequences of minimum wage changes for different racial or ethnic groups or about whether subminimum wages for teenagers have adverse effects for any adult groups. Nonetheless, one can safely predict that these papers will be cited often in future policy debates over minimum wage legislation.

⁴ Research that Alan Marcus and I conducted over a decade ago suggested that increases in minimum wages affect the distribution of educational outcomes. In particular, we found that increases in the minimum wage increase the educational levels of teenagers from middle- and upper-income families and decrease the educational levels of teenagers from low-income families (Ehrenberg and Marcus 1980, 1982). Such distributional effects should interest policy-makers as much as does the lack of aggregate educational effects found by this symposium's authors.

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THE EFFECT OF THE MINIMUM WAGE ON THE FAST-FOOD INDUSTRY

LAWRENCE F. KATZ and ALAN B. KRUEGER*

Using a longitudinal survey of fast-food restaurants in Texas, the authors examine the impact of recent increases in the federal minimum wage on a low-wage labor market. Less than 5% of fast-food restaurants were using the new youth subminimum wage in July/August 1991, even though the vast majority paid a starting wage below the new hourly minimum wage immediately before it became effective. Although some restaurants increased wages beyond the level needed to comply with higher minimum wages in both 1990 and 1991, those federal minimum wage increases greatly compressed the distribution of starting wages in the Texas fast-food industry. Two findings at variance with conventional predictions are that (1) employment increased more in those firms likely to have been most affected by the 1991 minimum wage increase than in other firms and (2) price changes were unrelated to mandated wage changes.

AFTER nearly a decade with no change in the federal minimum wage, legislation increased it from \$3.35 to \$3.80 on April 1, 1990, and increased it again to \$4.25 on April 1, 1991. The amendments to the Fair Labor Standards Act (FLSA) further permitted employers to pay teenage workers a subminimum or "training" wage equal to 85% of the minimum wage. Employers may currently pay teenage

workers as little as \$3.62 per hour for up to 6 months under these subminimum wage provisions. How have these changes to the minimum wage affected the low-wage labor market? This paper examines the impact of recent changes in the federal minimum wage on the fast-food industry.

Five main questions are raised in this paper. First, what is the utilization rate of the teenage subminimum wage? Second, what determines whether a restaurant will utilize the subminimum wage? Third, how has the minimum wage affected wage dispersion? Fourth, what effect has the increase in the minimum wage had on the level of employment at firms affected by the increase? And fifth, how has the minimum wage increase affected the price of fast-food items?

To answer these questions we conducted a longitudinal survey of fast-food restaurants in Texas in December 1990 and July/August 1991. Our choice of that sample reflects two primary consider-

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The data used in this paper will be supplied to other researchers on request to Alan B. Krueger, Department of Economics, Princeton University, Princeton, NJ 08544.

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ations. First, the minimum wage is a significant constraint on fast-food establishments. Our survey of Texas fast-food restaurants finds that one-third of restaurants started workers at the minimum wage prior to the April 1990 minimum wage increase, whereas half of restaurants started workers at the minimum wage shortly after the 1990 minimum wage increase, and over three-quarters of restaurants started workers at the minimum wage shortly after the April 1991 increase. Second, the fast-food industry is generally regarded as a highly competitive industry, with little firm attachment and high labor turnover. Thus, the fast-food industry offers a nearly ideal market to test the predictions of the textbook model of the minimum wage.

Texas Fast Food Restaurant Survey Design

To study the impact of recent changes in the minimum wage on a labor market in which we would expect the minimum wage to have a large impact, we conducted a survey of fast-food restaurants in Texas. We selected Texas because it is a large state with relatively many low-paid workers. In 1989, for example, the average hourly wage rate of retail trade workers in Texas was \$5.85, compared to a national average of \$6.52. For teenage workers, the average wage in Texas in 1989 was \$4.19 compared to \$4.61 nationwide, and 37.6% of teenage workers in Texas were paid between \$3.35 and \$3.79 per hour, compared to 25.7% nationwide.¹ Furthermore, Texas does not have a state minimum wage law that would override the FLSA.²

Moreover, the fast-food industry is a

low-wage industry even within retail trade. The industry has lobbied against increases in the minimum wage and has been a staunch supporter of a subminimum wage for youths (Bureau of National Affairs 1985). And the fact that the fast-food industry has extremely high turnover, and hires many first-time workers, makes it likely that fast-food restaurants can take advantage of the youth subminimum.³

Figure 1 outlines the timing of our surveys and the timing of changes in the minimum wage. In 1990 we designed an initial questionnaire to collect retrospective (pre-minimum wage increase) and current information on starting wages, as well as information on the utilization of the new subminimum wage and on non-wage responses to the minimum wage. This survey was administered in December 1990. In 1991 we revised the questionnaire, retaining most of the questions from the original survey, and adding new questions on prices of standard goods at the restaurants and wages of workers already at the firm. The second questionnaire was administered between July 8 and August 2, 1991.⁴

We conducted the survey as follows. We first collected the phone numbers of every Burger King, Wendy's, and Kentucky Fried Chicken outlet listed in the Yellow Pages of the metropolitan phone books for Texas for January 1990.⁵ We then drew a systematic sample consisting of every other phone number listed in the Yellow Pages. When duplicate numbers, disconnected numbers, and wrong numbers were deleted, 294 potential observa-

¹ Indeed, Love (1986) estimates that 1 in 15 workers obtained their first job from McDonald's! Although we're not sure whether this estimate is accurate, it is certainly true that many young workers obtain their first job in the fast-food industry.

² Copies of the 1990 and 1991 questionnaires (including mean responses) are available from the authors on request.

³ Burger King, Kentucky Fried Chicken, and Wendy's are the second, third, and fourth largest restaurant chains nationwide. We initially intended also to include McDonald's, the nation's largest chain. But because none of the McDonald's restaurants would respond to our pre-test survey, we dropped them from our sample.

¹ We are grateful to David Card for providing us with these statistics. The statistics are based on data from the Current Population Survey.

² The state minimum wage in Texas is \$3.35 per hour, and there is no provision for a subminimum. Therefore, the Texas state minimum wage law is irrelevant for jobs that are covered by the federal minimum wage. In some other states, the state minimum wage is high enough to prevent employers from utilizing the federal youth subminimum wage.

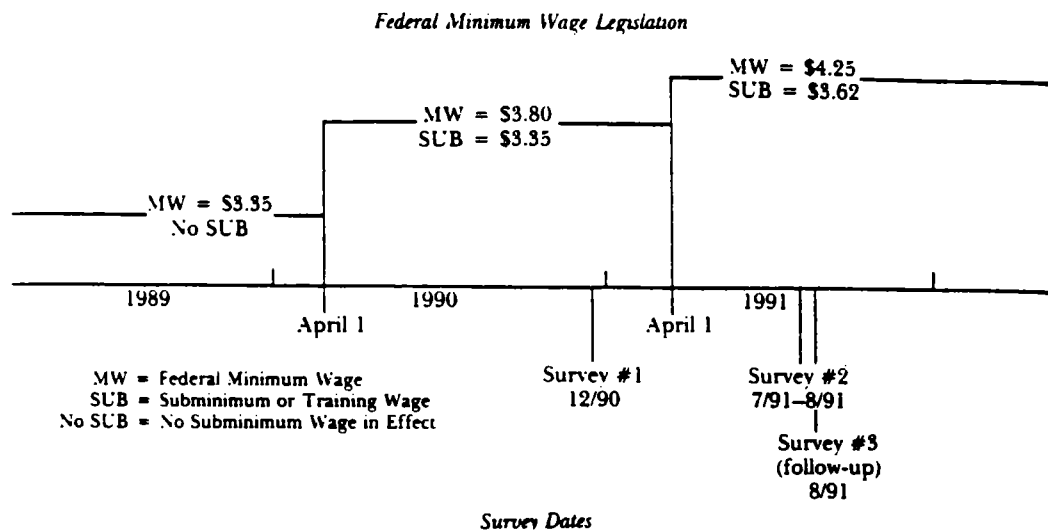


Figure 1. Chronology of Changes in Federal Minimum Wage Legislation and of the Implementation of the Authors' Surveys of Texas Fast-Food Restaurants.

tions remained.⁶ We then attempted to interview the manager or assistant manager of each restaurant by phone between December 12 and December 18, 1990. If a restaurant did not respond on the first call, we called back as many as two times to try to elicit a response. We obtained a total of 167 responses, for a response rate of 57% from the 1990 survey.⁷

For the follow-up survey we attempted to interview *every* restaurant listed in the 1990 phone books for Texas, including those that were originally sampled in 1990 and those that were not. A total of 330 restaurants were interviewed between July and August 1991 in the second wave of the survey; 110 of these firms had been interviewed in the first wave of the survey. The overall response rate in the second wave of the survey was 56%, and the response rate was 66% for the subset of firms that responded in the first wave of

the survey.⁸ We collected additional information about the local labor market in which each restaurant was located (such as the unemployment rate and size of the city) using the *County and City Data Book, 1988*.

To assess the reliability of responses to key questions on the survey, we randomly selected 30 restaurants that responded in the second wave of the survey, and re-interviewed them in August 1991. These sampled firms were asked the same set of questions regarding wages, prices, and employment that they were asked previously. We then calculated the correlation between responses on the original survey and on this re-interview survey. These correlations are an estimate of the ratio of the true variance of the variable to the total reported variance, under the assumption that reporting errors are uncorrelated with each other and with the true variable in each measurement. The correlations were generally in the .70 to .80

⁶ Of the restaurants listed in the phone book, 25 were unreachable because of closings, transcription errors, or some other reason for a disconnection, and 10 were wrong numbers.

⁷ Although there may be some concern about possible differences between respondents and nonrespondents, our tabulations did not reveal any systematic differences between restaurants that responded on the first call and those that required at least one follow-up phone call before responding.

⁸ Restaurants that paid a higher wage in December 1990 were more likely to respond in the second wave of the survey, but the relationship between wage and attrition was statistically insignificant. It may be that low-wage restaurants were somewhat more likely to close because of the increase in the minimum wage.

range. For example, the correlation between the two measurements was .76 for starting pay, .76 for log employment, .65 for the price of french fries, .72 for the price of soda, .85 for the percentage of workers who are black, and .93 for the percentage of workers who are Hispanic.

Table 1 presents a cross-tabulation of the starting wage for part-time workers of sampled restaurants before and after the April 1990 and April 1991 increases in the minimum wage.⁹ The table indicates that 71.4% of these restaurants were compelled to increase their starting wage by the 1990 rise in the minimum wage from \$3.55 to \$3.80. Furthermore, one-third of the restaurants moved their starting wage from exactly the old minimum to exactly the new minimum. In December 1990, 47% of restaurants were starting workers at exactly the minimum wage (\$3.80).

The April 1991 increase in the minimum wage from \$3.80 to \$4.25 had an even larger effect on restaurant wages. Some 95% of restaurants were forced to increase their starting wage by the 1990 increase in the minimum wage, and 75.8% of the restaurants paid new hires exactly the minimum wage (\$4.25) in the summer of 1991. Notice also that the fraction of restaurants that paid exactly the old minimum wage (\$3.80) was slightly higher in July/August 1991 than in December 1990 (47% versus 55.4%). This finding suggests that the low-wage labor market in Texas was slipping before the 1991 higher minimum wage took effect, perhaps due to the onset of the 1991 recession. These tabulations indicate that our survey has identified a universe of employers that is likely to be affected by the minimum

wage, and that has potential to use the youth subminimum wage.

Utilization of the Youth Subminimum Wage

Our initial survey found that a very small percentage of fast-food restaurants took advantage of the teenage subminimum wage provisions (see Katz and Krueger 1991). For example, only 1.8% of fast-food restaurants in our survey used the subminimum wage in December 1990. This estimate is consistent with Freeman, Gray, and Ichniowski's (1981) finding that only 3% of students' work hours were covered by the subminimum wage permitted for full-time students in the late 1970s. The youth subminimum or "training" wage is much easier to use than the full-time student exemption. Notably, the new youth subminimum applies to all teenage workers (not just full-time students), and requires less cumbersome restrictions on employees' hours. Moreover, under the new law, no additional training is required for the first 90 days, and only a minimal amount of training is necessary if the subminimum is to be used for an additional 90 days.

Our second survey finds that utilization of the youth subminimum increased to 4.8% of restaurants in July/August 1991. Interestingly, only 34.1% of managers responded that they were unaware of the subminimum wage law in December 1990, and roughly the same fraction (31.5%) responded that they were unaware of the subminimum in the summer of 1991.

In our initial survey of fast-food restaurants in 1990 we described the subminimum wage law to managers as a preamble to our question on subminimum wage use. Since we interviewed a random sample of restaurants in 1990, and then interviewed a wider sample in 1991, we can test whether informing managers about the existence of the subminimum wage increased the restaurant's awareness of this option. We find no relationship between whether a manager responded that he or she was aware of the subminimum wage law and whether the restaurant was

⁹ We use the wage of part-time workers if the restaurant reports a part-time wage, and the wage of full-time workers if the part-time wage is missing. In 1991, all restaurants in the sample that provided wage information paid the same wage to full- and part-time workers. In April 1990, 97% of restaurants paid the same wage to full- and part-time workers, and in December 1990 the figure was 93%. Table 1 includes information on all the restaurants that provided data on starting wages. In each subsequent table, we use the maximum possible sample of restaurants that have information on all the relevant variables for that table.

Table 1. Cross-Tabulations of Starting Wage Before and After Two Minimum Wage Increases: Fast-Food Restaurants in Texas, 1990 and 1991.

A. Minimum Wage Increase from \$3.35 to \$3.80, April 1, 1990			
Wage Before April 1990	Wage in December 1990		Row Total
	\$3.80	> \$3.80	
\$3.35	52 (31.7%)	8 (4.9%)	60 (36.6%)
(\$3.35, \$3.80)	23 (14.0%)	34 (20.7%)	57 (34.8%)
\$3.80	2 (1.2%)	11 (6.7%)	13 (7.9%)
> \$3.80	0 (0%)	34 (20.7%)	34 (20.7%)
Column Total	77 (47.0%)	87 (53.0%)	164 (100%)
B. Minimum Wage Increase from \$3.80 to \$4.25, April 1, 1991			
Wage Before April 1991	Wage in July/August 1991		Row Total
	\$4.25	> \$4.25	
\$3.80	164 (52.2%)	10 (3.2%)	174 (55.4%)
(\$3.80, \$4.25)	71 (22.6%)	52 (16.6%)	123 (39.2%)
\$4.25	3 (1.0%)	12 (3.8%)	15 (4.8%)
> \$4.25	0 (0%)	2 (0.6%)	2 (0.6%)
Column Total	238 (75.8%)	76 (24.2%)	314 (100%)

Note: This table gives the number of restaurants in each cell, with the percentage of the total underneath in parentheses. One restaurant that reported paying \$3.75 per hour in April 1991 is recorded as paying \$3.80 per hour.

interviewed in our initial survey. We also find that the firms that were included in the initial survey were slightly more likely to use the subminimum wage (5.6%, versus 4.2% of those not included in the initial survey), but this difference is not statistically significant ($t = 0.53$). Thus, informing restaurant managers about the subminimum wage law in 1990 appears to have had no discernible effect on their restaurants' propensity to use the subminimum in 1991.

A possible reason for the slight increase in the utilization of the subminimum wage is that the benefit to employers of using the subminimum wage was greater in 1991 than in 1990. First, the gap between the subminimum wage and the minimum wage was greater in absolute value and in percentage terms in 1991 than it was in

1990.¹⁰ Second, the minimum was likely to be farther above the equilibrium wage in the summer of 1991 than in late 1990. Indeed, our survey results suggest that more workers in Texas would have accepted a fast-food job at a subminimum wage (if offered) in 1991 than in 1990. In 1991, 37.9% of managers of restaurants that were not using the subminimum wage believed they could "attract *qualified* teenage workers at a subminimum wage." In 1990, this figure was just 17.5%.¹¹

¹⁰ Although the subminimum wage is set at 85% of the minimum wage, the subminimum was fixed at \$3.35 (11.8% below the minimum wage) for the first increase in the minimum wage.

¹¹ Another possible reason for this trend is that the supply of teenage employees to fast-food restaurants is likely to be more plentiful in the

In spite of the increase in the percentage of managers who believed they could attract teenage workers at a rate below the minimum wage, even in 1991 the majority of respondents said they believed that they could not attract teenage workers at a rate below the minimum wage. Because 95% of these firms were offering new workers an hourly wage rate below \$4.25 just before the minimum was increased to \$4.25, it is quite surprising that a large majority of respondents believed that they could not attract workers at a subminimum wage. One explanation for this finding is that restaurants were "supply-constrained" when they offered a wage below \$4.25, and thus could not attract enough workers at the former wage. Alternatively, managers may feel that relative pay is important to workers, and that workers will not accept jobs if they are paid less than others doing the same work. Workers may also be unwilling to accept jobs at the subminimum wage if it is easier to search for a job paying the new higher minimum wage from unemployment than from employment.

About 20% of managers at firms that were not using a subminimum wage said they believed it is not fair to use a subminimum wage, and about half of managers who offered a response said they believed that if the subminimum wage could be paid to all workers, not just teenage workers, their restaurant would use the subminimum wage. On the other hand, 23% of managers responded that the difficulty of applying for the subminimum wage is at least one reason why their restaurant did not offer a subminimum wage. This figure is up from 7.3% in 1990. Finally, about one-third of managers who offered a response said that their restaurant would use the subminimum wage if it were easier to administer—for example, if the time limitation or training requirement were eliminated.

To better understand the reasons for the low utilization of the subminimum wage, we have estimated logit models to

predict which restaurants use the subminimum wage. In particular, we are interested in whether the gap between the store's starting wage prior to the minimum wage increase in April 1991 and the new minimum wage (\$4.25) is positively related to the likelihood it uses the subminimum wage. One would expect that firms will find it more attractive to offer a subminimum wage if the minimum wage forces them to raise their wage by a large amount. Our analysis is based on data collected in the 1991 survey. Table 2 summarizes the logit estimates.

The explanatory variables in the logit models are not very successful at explaining utilization of the subminimum wage. For example, the reported chi-square tests of the hypothesis that the independent variables jointly have no effect have probability values ranging from .34 to .02, depending on the model. Nevertheless, some tentative conclusions can be drawn from the logit estimates.

First, although the amount by which a restaurant falls short of the new minimum wage is positively associated with utilization of the subminimum wage, this variable has a statistically insignificant effect. Second, restaurants that have a higher proportion of workers who are Hispanic or black are more likely to utilize the subminimum wage. Moreover, these findings for the proportion of minority workers hold up after we include dummy variables for seven regions of Texas. Third, restaurants that employ a work force consisting of over 90% teenage workers are more likely to use the subminimum wage, but this variable does not have a statistically significant effect.

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The Effect of Minimum Wage Increases on Compensation

Table 3 presents averages of several measures of compensation, broken down by whether the restaurant started workers at \$3.80 per hour, between \$3.81 and \$4.24 per hour, or at least \$4.25 per hour just before the minimum wage increase

summer (when the 1991 survey was conducted) than in the winter (when the 1990 survey was conducted).

Table 2. Logit Estimates of Subminimum Wage Utilization.
(Standard Errors in Parentheses)

Variable	(1)	(2)	(3)
Intercept	-3.818 (0.090)	-3.836 (1.266)	-5.868 (1.644)
Gap Between April Wage and \$4.25	2.447 (2.811)	2.125 (2.810)	1.346 (2.780)
Company Owned (1 = Yes)	—	-0.852 (0.643)	-0.764 (0.656)
Wendy's (1 = Yes)	—	-0.814 (1.113)	-0.867 (1.128)
Kentucky Fried Chicken (1 = Yes)	—	1.335 (0.656)	1.155 (0.661)
Proportion of Workers Who Are Hispanic	—	—	3.334 (1.359)
Proportion of Workers Who Are Black	—	—	2.548 (1.455)
Proportion of Teenagers > .90 (1 = Yes)	—	—	0.95 (0.855)
P-value for χ^2	0.344	0.085	0.022

Note: The sample size is 282, and the mean of the dependent variable is .053.

took effect on April 1, 1991. Restaurants that paid the minimum wage (\$3.80) prior to April 1991 increased their starting wage by 12% (46 cents), on average, to just over the new minimum wage (\$4.26), by July/August 1991. In contrast, over the same period, restaurants that were initially above the new minimum wage increased their starting wage by just 4.6% (20 cents), on average.

There are two potential explanations for why firms that were already paying above the new minimum wage increased their starting wage after the minimum wage increased. First, as Grossman (1983) and Akerlof and Yellen (1990) contend, relative wages may influence work effort, so firms already above the minimum wage may adjust their wages to maintain effort levels. Second, it is possible that market

Table 3. Response to the Change in the Minimum Wage by Starting Wage Prior to April 1, 1991.

Description	(1) Starting Pay = \$3.80	(2) Starting Pay Between \$3.80 and \$4.25	(3) Starting Pay ≥ \$4.25
Proportion Using the Youth Subminimum	0.06	0.03	0.06
Average Starting Wage Before April 1, 1991	\$3.80	\$3.93	\$4.28
Increase in Starting Pay from April 1 to December 1991	\$0.46	\$0.37	\$0.20
Proportion Maintaining Wage Hierarchy	0.16	0.33	NA
Proportion with Spillover to Workers Earning \$4.50 per Hr.	0.09	0.29	0.60
Proportion Decreasing Amount of First Pay Raise	0.05	0.03	0.00
Proportion Increasing Time to First Pay Raise	0.03	0.05	0.00
Proportion That Cut Fringe Benefits	0.04	0.04	0.06
Sample Size	174	122	17

Note: The proportion maintaining the wage hierarchy is the proportion of restaurants that after April 1, 1991, paid a wage above the restaurant's new starting wage to workers who prior to April 1, 1991, had earned between the restaurant's starting wage and \$4.25. The proportion with spillover to workers earning \$4.50 per hour is the fraction of restaurants that increased the pay of workers earning \$4.50 once the minimum wage increase took effect.

forces would have led to a small increase in wages in the fast food industry in Texas even in the absence of the minimum wage increase.

In Table 4 we report estimates of regressions of the log of the starting wage on several independent variables, using data from both waves of our survey. The 1990 and 1991 increases in the minimum wage led to a substantial reduction in the dispersion of starting wages across restaurants. For example, the standard deviation of the log wage decreased from .074 in April 1990, to .046 in December 1990, to .02 in April 1991, and to just .022 in July/August 1991.

The decline in wage dispersion is reflected in the wage regression estimates. For example, the regressions show that before April 1990, company-owned restaurants paid a higher starting wage than franchisee-owned restaurants (see also Krueger 1991), and restaurants in areas with a higher unemployment rate had higher wages. Both of these effects, however, decreased substantially after the minimum wage increased to \$3.80 (December 1990), and the coefficients contin-

ued to shrink after the minimum wage increased to \$4.25. Similarly, the Kentucky Fried Chicken chain offered a 6% ($t = 3.5$) higher wage rate than Burger King before April 1990, and this differential was insignificant by July/August 1991. And the differentials in pay across regions of Texas were virtually eliminated by the increases in the minimum wage. For example, before the April 1990 increase in the minimum wage, restaurants in Dallas paid 8% more than restaurants in the Rio Grande area, but this gap became insignificant in July/August 1991.

Our survey also collected information on how within-firm wage policy responded to the increases in the minimum wage. In particular, suppose a firm paid \$3.80 per hour to new workers before April 1990, and then increased its starting wage to \$4.25. What did such a firm do to the pay of incumbent workers whose wages had risen to a rate of, say, \$4.00? Our results indicate that 16% of firms in this situation increased the wage of the worker earning \$4.00 to above the new starting wage, and thus maintained their wage hierarchies; the remainder com-

Table 4. Log Wage Equations for Starting Wages at Various Dates.
(Standard Errors in Parentheses)

Variable	Time Period			
	Before Apr. '90 (1)	Dec. '90 (2)	Before Apr. '91 (3)	Aug. '91 (4)
Intercept	1.199 (0.090)	1.365 (0.063)	1.282 (0.030)	1.425 (0.020)
Company-Owned (1 = Yes)	0.033 (0.013)	0.018 (0.009)	0.007 (0.005)	0.002 (0.003)
Wendy's (1 = Yes)	0.024 (0.014)	0.015 (0.010)	0.011 (0.005)	0.002 (0.003)
Kentucky Fried Chicken (1 = Yes)	0.060 (0.017)	0.023 (0.012)	0.016 (0.006)	0.010 (0.004)
Number of Employees	0.001 (0.018)	-0.010 (0.013)	0.008 (0.005)	0.004 (0.004)
Unemp. Rate in 1986	-0.576 (0.206)	-0.156 (0.143)	-0.143 (0.068)	-0.054 (0.047)
Log Population of City in 1986	0.005 (0.005)	0.002 (0.004)	0.004 (0.002)	0.001 (0.001)
Mean Log Wage	0.280	0.167	0.100	0.050
SD of Log Wage	1.277	1.369	1.355	1.457
SD of Log Wage	0.072	0.046	0.032	0.022
Sample Size	138	138	287	287

pressed whatever wage differentials existed between long-service workers and new hires. We asked a similar question in the first wave of the survey (for example, what happened to the earnings of someone whose wage rate rose from \$3.35 to \$3.50 once the minimum wage increased to \$3.80?), and found that 41% of restaurants maintained their wage hierarchy. Thus, firms were much more likely to preserve wage differentials between new workers and long-service workers after the 1990 increase in the minimum wage than after the 1991 increase. Less concern for internal equity in 1991 may have resulted because the rise in the minimum wage to \$4.25 is likely to have conferred more rents to infra-marginal workers than the rise to \$3.80.

A related question is whether firms increased the pay of workers who were already earning above \$4.25 an hour before the minimum wage increase took effect. We find that firms were less likely to increase these workers' relative earnings than they were to increase the relative earnings of someone earning between \$3.80 and \$4.25 (see row 5 of Table 3). Not surprisingly, there is less of a spillover effect of the minimum wage increase further up the wage hierarchy.

Finally, we examined whether firms delayed the time until workers receive their first pay raise or reduced the amount of the first raise in response to an increase in the minimum wage. Rows 6 and 7 of Table 3 provide some information on these questions. Although restaurants that were forced to increase their starting wage by the rise in the minimum wage are more likely to delay the first raise they give to workers, and to reduce the amount of the first raise, only a small proportion of firms took these actions. Furthermore, 91% of restaurants offered at least some fringe benefits to workers, and relatively few restaurants reduced fringes.

Employment Effects of the Minimum Wage

We next examine the effects of recent increases in the federal minimum wage on

employment in the Texas fast-food industry. The conventional competitive model of the low-wage labor market predicts that, *ceteris paribus*, a mandated wage increase arising from a change in the minimum wage should reduce employment in affected establishments. We examine this issue by comparing employment growth of establishments classified by the likely degree of impact of minimum wage changes. By comparing employment changes of establishments in one industry and state, we eliminate the effects of industry and state shocks to employment that may be correlated over the period examined with the extent of wage changes induced by the minimum wage. Our methodology is similar to the approach used by the U.S. Department of Labor (1959) and Lester (1964) in earlier establishment-based studies of the employment effects of minimum wage laws.¹²

We first analyze the employment effects of the minimum wage increase from \$3.80 to \$4.25 in April 1991 using the matched sample of establishments that responded to both our December 1990 and July/August 1991 surveys. For 100 establishments, we have complete data on the number of full-time employees, number of part-time employees, and average starting wage for nonmanagement employees both several months before (in December 1990) and several months after (in July/August 1991) the most recent increase in the federal minimum wage. We measure the likely impact of the minimum wage increase on an establishment's level of employment by the proportional increase required in the firm's starting wage for the firm to minimally comply with the new minimum wage of April 1, 1991. The log minimum wage gap is defined as $\max(0, \log(4.25/W))$ where W is the establishment's starting wage for nonmanagement employees in December 1990. The log minimum wage gap ranges from 0.11 (\$0.45 in levels) for firms at the old minimum wage of \$3.80 to 0 for those

¹² See also Cullen (1961) for a thoughtful evaluation of the evidence on minimum wage effects based on the early literature.

already paying at least \$4.25 prior to the most recent minimum wage increase.

Table 5 presents regression estimates of the effects of wage changes mandated by the minimum wage increase of April 1991 on employment growth from December 1990 to July/August 1991 for our sample of matched establishments. The table presents both the OLS estimates of reduced form models linking employment changes directly to the log minimum wage gap, and two stage least squares estimates of models in which the actual change in the log starting wage is instrumented for by the log minimum wage gap. The first two columns present estimates of equations in which the dependent variable is the change in log total employment (with full-time and part-time workers counted equivalently). The reduced form model estimates indicate that, contrary to the predictions of the conventional competitive labor market model, employment growth was positively related to the size of wage increases mandated by the minimum wage.¹³ The instrumental variables estimates in column (2) show a similar story. The estimates of positive minimum wage effects on employment are statistically significant at the 10% level (probability values of approximately 0.07) in both models. The estimates are also moderately large, with an elasticity of 1.70 to 1.85.

Columns (3) and (4) of Table 5 present analogous employment change equations with employment measured in full-time equivalent units (FTEs).¹⁴ The results are

• even more striking than those using the total number of employees. Employment in FTEs increased by substantially more in establishments with larger mandated wage increases, and the estimates are highly statistically significant. A 10% mandated wage increase is predicted to raise relative employment in FTEs by approximately 25%. The estimated effects of minimum wage-induced wage changes on employment presented in Table 5 are not very sensitive to the choice of covariates. For example, if we include seven region dummies along with the covariates in column (4) of Table 5, the coefficient on the change in log starting wage is 2.19 with a standard error of 1.10.¹⁵

The positive relationship between the wage increase required by the new minimum wage and change in employment is displayed in a scatter diagram in Figure 2. Although some outliers are apparent, the figure illustrates that log employment growth in FTEs was higher on average in establishments with large minimum wage gaps (\$0.45) in December 1990 than in those with starting wages at or above \$4.25. Average log employment growth varied from $-.168$ ($n = 11$) for establishments with wages of \$4.25 or higher in December 1990, to $.058$ ($n = 23$) for establishments paying exactly \$4.00 initially, to $.168$ ($n = 40$) for those paying the old minimum wage of \$3.80 initially. The corresponding median values for employment growth are 0, .05, and .15, respectively.

Because of concern over the possible effects of outliers, we have estimated the employment growth models by minimizing the sum of absolute deviations (LAD), in addition to the OLS estimates. The

¹³ At the suggestion of a referee, we also estimated specifications that included the proportionate gap between the minimum wage and the restaurant's starting wage just prior to the April 1990 increase in the minimum wage (that is, the proportionate increase to reach \$3.80). This new variable could be thought of as a lag of the minimum wage gap that we have included. The log minimum wage gap was highly correlated in both periods. Nevertheless, both log minimum wage gaps were estimated to have a positive effect if they were included together in the model, and the coefficient was larger for the December 1991 log wage gap.

¹⁴ The number of full-time equivalents equals the number of full-time employees plus 0.57 times the number of part-time employees. This definition is based on our tabulations of data from the 1982-83

survey of employees in the fast-food industry conducted by the National Institute for Work and Learning (NIWL). We find in this data a ratio of average weekly hours of part-time employees to those of full-time employees of 0.57. See Charner and Fraser (1984) for a discussion of the NIWL survey.

¹⁵ One could argue that region dummy variables should be included to capture possible correlations between local labor market shocks during our sample period and initial wage levels.

Table 5. Regressions of Employment Changes on Wage Changes Mandated by the Increase in the Federal Minimum Wage of April 1991.
(Standard Errors in Parentheses)

Variable	Change in Log Employment (Dec. '90-Aug. '91)		Change in Log FTE Employment (Dec. '90-Aug. '91)	
	(1) Reduced Form	(2) 2SLS ^a	(3) Reduced Form	(4) 2SLS ^a
Intercept	0.087 (0.372)	0.190 (0.366)	-0.198 (0.396)	-0.051 (0.392)
Change in Log Starting Wage ^b	—	1.734 (0.934)	—	2.478 (1.001)
Log Min. Wage Gap ^c	1.850 (0.997)	—	2.643 (1.062)	—
Company Owned (1 = Yes)	-0.051 (0.089)	-0.048 (0.090)	-0.034 (0.095)	0.029 (0.096)
Burger King (1 = Yes)	0.003 (0.094)	0.017 (0.093)	-0.056 (0.101)	-0.036 (0.100)
Kentucky Fried Chicken (1 = Yes)	0.113 (0.108)	0.089 (0.109)	0.034 (0.115)	-0.000 (0.117)
Log Population of City in 1986	-0.018 (0.029)	-0.026 (0.029)	0.007 (0.030)	-0.005 (0.031)
R ²	0.055	—	0.067	—
S.E. of Regression	0.363	0.363	0.387	0.389
Sample Size	100	100	100	100

Note: The number of full-time equivalents equals full-time employees plus 0.57 times the number of part-time employees. Reduced form models are estimated by OLS.

^a The log minimum wage gap is used as an instrument for the change in the log starting wage.

^b Change in log starting wage of nonmanagerial employees from December 1990 to July/August 1991.

^c The log minimum wage gap equals $\max(0, \log(4.25/W))$ where W is the starting wage for nonmanagerial employees in December 1990.

LAD estimates of the employment effects of wage increases are smaller than the OLS estimates but still positive. For example, the coefficient on the log minimum wage gap is 1.16 with a standard error of .55 if the model in column (3) of Table 5 is by LAD instead of by OLS.¹⁶ This finding suggests that our positive employment effect is not merely a result of undue influence from outliers.

The estimated positive effects of wage changes on employment are larger if employment is measured by FTEs than if it is measured by the total number of workers, implying that the share of total employment accounted for by full-time employees increased in establishments with large mandated wage increases relative to other establishments. This finding

suggests that minimum wage increases induced firms to substitute full-time for part-time employees. In fact, the overall level of total employment per establishment in our entire survey samples remained fairly stable from December 1990 to July/August 1991, but full-time employment per establishment increased from 6.91 to 8.91 and part-time employment per establishment fell from 15.41 to 12.89.¹⁷

Two caveats should be noted in interpreting our finding of a positive effect of the higher minimum wage on employ-

¹⁶ The standard error was estimated by bootstrapping the model, using 50 replications.

¹⁷ We note, however, that seasonality in full-time employment may also account for the relative increase in full-time employment between December 1990 and August 1991. Seasonality will not influence our estimates of the minimum wage effect in Table 5 because seasonal demand fluctuations are likely to affect equally restaurants with different initial wage levels.

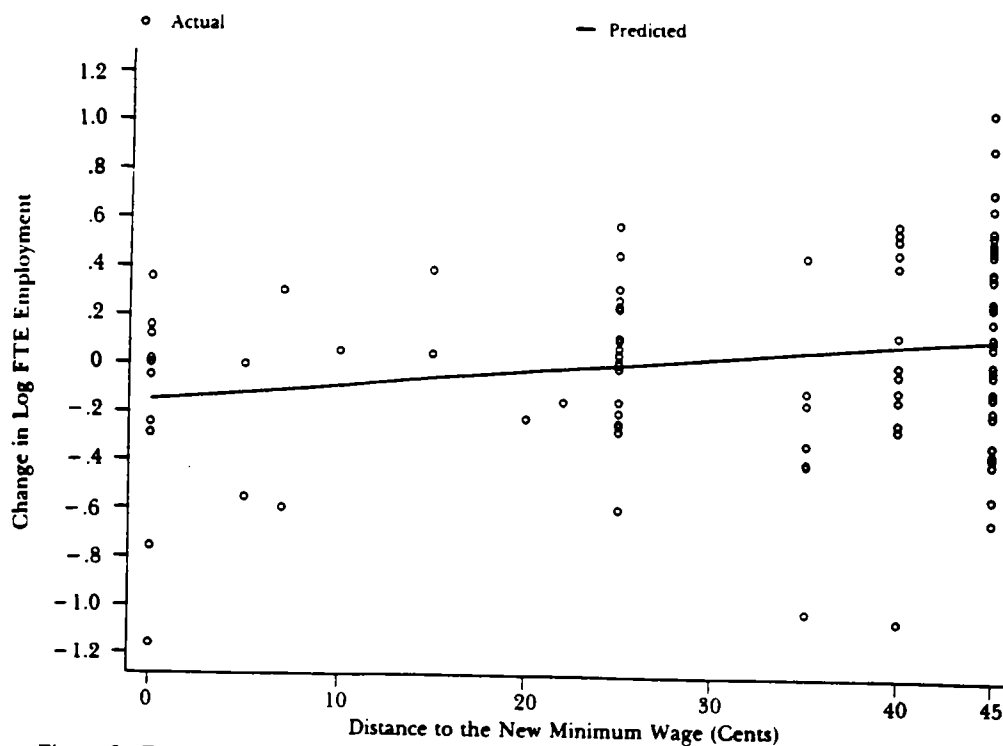


Figure 2. Employment Effects of the April 1, 1991, Minimum Wage Increase on Texas Fast-Food Restaurants: Changes in Full-Time Equivalent Employees (FTEs) Plotted Against the Difference Between the New Minimum Wage and the Establishment's Wage Rate Prior to the Effective Date of the New Minimum Wage Law.

ment in the fast-food industry. First, our sample is limited to restaurants that were in operation before and after the minimum wage increased. It is possible that the higher minimum wage caused restaurants to close, thereby reducing total employment in the industry. Further, the rate of formation of new restaurants might have slowed down because of the minimum wage. Both of these forces might have caused employment to grow at the restaurants that remained in operation. Second, although our estimated coefficients for the wage variable in the employment equations are statistically significant, they have relatively large standard errors.

These caveats aside, a model in which the employers of low-wage workers are assumed to have market power and act as monopsonistic buyers of labor (Stigler 1946; Sullivan 1989) is potentially consistent with the findings presented in Table 5 and Figure 2. In the standard monopsony

model, a binding minimum wage can increase both employment and wages. Our estimates in Table 5 are consistent with a model of monopsony with an elasticity of supply of labor to individual fast-food restaurants ranging from 1.70 to 2.65. These elasticities indicate a substantial amount of monopsony power in the short run (over an eight-month period).

A possible interpretation of this type of monopsony model is that low-wage employers have some degree of monopsony power over their existing employees and do not increase wages to attract additional outside employees because internal equity concerns essentially require them to raise the wages of all existing employees to the level of wages of new recruits. The cost of raising the wages of infra-marginal workers outweighs the benefits of attracting new employees with higher starting wages. The responses to both of our surveys of Texas fast-food restaurants indicate much

employer concern with the fairness of the internal wage structure. The same equity concerns that appear to make establishments reluctant to use the subminimum wage may make them reluctant to raise wages when they have some monopsony power over a subset of workers. A potential problem with this monopsony interpretation of our employment findings is that a large degree of monopsony power seems somewhat implausible in the high-turnover labor market of the fast-food industry.

Our failure to find conventional negative effects of minimum wage increases on employment is consistent with earlier research using establishment data. Lester (1964:507-27) reviewed a series of studies of the effects of the minimum wage increase of March 1, 1956 (from \$0.75 to \$1.00) on employment changes in establishments in low-wage industries and regions. These studies compared employment growth in specific industries and regions among establishments classified by the percentage increase in average hourly wages mandated by the change in the law. The studies show a wide range of patterns of employment changes classified by minimum wage impact. Lester concluded, "The statistics . . . do not lend much support to the notion that a forced increase in the minimum wage will soon lead to a reduction in a firm's employment in proportion to the relative size of the wage increase" (pp. 523-24).

Card More recently, Card (1991) examined the effect of a substantial increase in the state minimum wage in California (from \$3.35 to \$4.25). He found that the employment rate of teenagers in California increased both absolutely and relative to the employment rate of teenagers in other "comparable" states after the minimum wage increase took effect.¹⁸ Thus, we conclude that studies based on cross-section comparisons of changes in employ-

ment of affected and unaffected groups from changes in minimum wage laws in the United States do not seem to find the conventional negative employment effects apparent from many time-series studies (such as Brown, Gilroy, and Kohen 1983).¹⁹ Future work should attempt to reconcile the different findings from these alternative methodologies. *Shifts & hours*

Further information on employment changes is available from our two surveys of Texas fast-food establishments. In the first survey on the effects of the minimum wage increase of April 1990, we asked each firm whether the number of workers on a shift or the number of shifts per day was reduced because of the minimum wage increase. We find little difference in responses between those directly constrained by the minimum wage increase and those already paying starting wages above the new minimum wage prior to April 1990. The vast majority of constrained and unconstrained firms reported that employment was not affected by the minimum wage increase. We asked a similar question in our July/August 1991 survey of the effects of the April 1991 minimum wage increase. In this case, the responses lend slight support to the conventional model: 10.5% of firms constrained by the new minimum (those previously paying under \$4.25) responded that they had reduced the number of nonmanagement workers on a shift since April 1, 1991, whereas 6% of firms initially paying an hourly wage of \$4.25 or above responded that they had reduced employment since April 1, 1991.

We conclude that our surveys provide little evidence of significant adverse effects of minimum wage increases on employment. Direct measures of employment and wages at the survey dates indicate that employment increased substantially more rapidly from December 1990 to July/

¹⁸ Card ("Using Regional Variation in Wages . . .," this issue) similarly fails to find conventional negative employment effects of the 1990 federal minimum wage increase in an analysis that uses regional variation in the likely impact of the increase on the low-wage labor market.

¹⁹ A comparison of employment changes across industries by the likely degree of impact of the minimum wage does seem to follow the negative correlation predicted by a standard competitive model for the large increases in the minimum wage in Puerto Rico studied by Castillo-Freeman and Freeman (1992).

Table 6. Two Stage Least Squares Estimates of Price Change Equations.
(Standard Errors in Parentheses)

Variable	Change in Log Price from January 1 to July/August 1991			
	(1) Full Meal ^a	(2) Soda	(3) Fries	(4) Main Course ^a
Intercept	0.092 (0.372)	0.118 (0.224)	0.164 (0.040)	0.038 (0.038)
Change in Log Starting Wage ^b	-0.089 (0.133)	-0.129 (0.224)	-0.367 (0.204)	0.121 (0.196)
Company Owned (1 = Yes)	-0.014 (0.006)	-0.033 (0.010)	0.001 (0.009)	-0.003 (0.008)
Burger King (1 = Yes)	-0.001 (0.006)	-0.017 (0.011)	0.006 (0.010)	0.020 (0.010)
Kentucky Fried Chicken (1 = Yes)	0.009 (0.007)	0.002 (0.011)	0.003 (0.010)	0.024 (0.010)
Log Population of City in 1986	-0.003 (0.002)	-0.004 (0.003)	-0.007 (0.003)	0.000 (0.003)
7 Region Dummies	Yes	Yes	Yes	Yes
S.E. of Regression	0.038	0.064	0.058	0.056
Sample Size	266	266	266	266

Note: All models are estimated by two stage least squares.

^a A full meal consists of a soda, french fries, and a main course. A main course consists of a basic hamburger at Burger King and Wendy's, or six pieces of chicken at Kentucky Fried Chicken.

^b Change in log starting wage of nonmanagerial employees from April 1991 to July/August 1991. This variable is treated as endogenous and instrumented for using the log minimum wage gap. The log minimum wage gap equals $\max(0, \log(4.25/W))$ where W is the starting wage for nonmanagerial employees prior to April 1991.

August 1991 in firms where the minimum wage increase of April 1991 had a substantial bite than in firms less constrained by the minimum wage increase. Establishment responses to questions concerning the direction of changes in employment of nonmanagement employees lead to more ambiguous findings.

Price Effects of the Minimum Wage

The final issue we examine using our survey data is the effect of the April 1991 minimum wage increase on the prices of meals at fast food restaurants. The conventional model of the effect of a binding minimum wage implies an increase in labor costs should translate into an increase in product prices. To a first order approximation, the increase in price should be proportional to minimum-wage labor's share of factor costs. In contrast, some monopsony models predict that a small increase in the minimum wage will increase industry employment and output and reduce industry product prices.

In our survey of July/August 1991, we asked about the prices of three standard items at each restaurant: a medium soda, a small order of french fries, and a main course. The main course was a basic hamburger at restaurants in the Burger King and Wendy's chains, and six pieces of chicken in the Kentucky Fried Chicken chain. The survey included questions about both current prices, time since the last price change, and the price in January 1991.

Table 6 presents estimates of the effects of wage changes induced by the April 1991 increase in the minimum wage on the prices of a full meal, soda, french fries, and a main course.²⁰ The dependent variable in each model is the log price change from January to July/August 1991 of the relevant item. Each equation is estimated by two stage least squares, with the change in log starting wage treated as endogenous and instrumented for by the

²⁰ A full meal, for our purposes, consists of a soda, french fries, and a main course.

log minimum wage gap measured prior to April 1, 1991. The table provides little evidence of relative price increases in those establishments with larger mandated wage increases. The results indicate that the price of a full meal tended to decline in restaurants with large mandated wage increases relative to restaurants not much affected by the minimum wage change. The price effects are not large and are fairly imprecisely estimated. The reported equations include region dummies to control for local demand shocks. The basic results are not very different (small and insignificant price effects) when the region dummies or the other covariates are omitted from the models.

Conclusion

Several tentative conclusions can be drawn from our analysis. First, it appears that relatively few employers use the youth subminimum wage, even in an industry where many employers could probably readily attract teenage workers at a subminimum wage. The subminimum training wage program is experimental and due to expire on April 1, 1993. Since only a small minority of employers has taken advantage of the subminimum wage, we see little grounds for strong support of, or opposition to, the subminimum wage. Second, we have found evidence that several fast-food restaurants increased wages for workers by an amount exceeding that necessary to comply with the higher minimum wage in 1990. However, there was less of a spillover of the minimum wage to other wages after the 1991 increase in the minimum wage than after the 1990 increase.

Finally, the evidence on employment

and price changes does not seem consistent with a conventional view of the effects of increases in a binding minimum wage. Our results indicate that employment increased at firms most affected by the minimum wage increase, and price changes appear to be unrelated to changes in wages resulting from the minimum wage increase. Of course, larger increases in the minimum wage may well result in employment decreases and price increases. Indeed, Castillo-Freeman and Freeman (1992) find that the relatively high minimum wage in Puerto Rico has resulted in substantial employment losses. Under certain conditions, monopsony models predict that a small increase in the minimum wage leads to an increase in employment, whereas a large increase in the minimum wage leads to a decrease in employment.

The behavior that we have documented in this article seems difficult to explain with the standard model that economists use to evaluate the impact of a minimum wage. It would be useful to know if our empirical findings hold up in other establishment-based analyses of the impact of the minimum wage.²¹ Finally, since our analysis is based on a subset of employers that remained in continuous operation before and after an increase in the minimum wage, it would be useful to investigate whether increases in the minimum wage lead to an increase in the failure rate of existing firms and a reduction in the birth rate of new firms.

²¹ We note that a preliminary analysis of a new data set on restaurants in Mississippi and North Carolina by Spriggs, Swinton, and Simmons (1992) finds results generally similar to ours.

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