4.10 Policy Application: The Employment Effects of Minimum Wages

The U.S. federal government introduced mandatory minimum wages in the labor market in 1938 as one of the provisions of the Fair Labor Standards Act (FLSA). In 1938, the nominal minimum wage was set at 25 cents an hour, and only 43 percent of nonsupervisory workers were covered by the minimum wage provisions of the FLSA. Workers in such industries as agriculture and intrastate retail services were exempt from the legislation. As Figure 4.18 shows, the nominal minimum wage has been adjusted at irregular intervals in the past six decades. In 1997, the last time that the nominal minimum wage was increased, the wage floor was set at $5.15 an hour. The coverage of the minimum wage has also been greatly expanded. Most workers who are not employed by state or local governments are now covered by the legislation.

Figure 4.18 illustrates an important characteristic of minimum wages in the United States: They have not been indexed to inflation or productivity growth. As a result, the real minimum wage declines between the time that the nominal floor is set and the next time that Congress raises it. For instance, the minimum wage was set at $3.35 per hour in 1981, or 42 percent of the average wage in manufacturing. In 1989, the nominal minimum wage was still $3.35 per hour, but this wage was only 32 percent of the average wage in manufacturing. The "ratcheting" in the real minimum suggests that the economic impact of minimum wages declines the longer it has been since it was last raised.

Figure 4.19 illustrates the standard model economists use to analyze the impact of the minimum wage on employment. Initially the competitive labor market is in equilibrium at wage level \( w^* \) and employment \( E^* \). The government imposes a minimum wage of \( \bar{w} \). Let’s assume initially that this minimum wage has universal coverage, so that all workers in the labor market are affected by the legislation, and that the penalties associated with paying less than the minimum wage are sufficiently stiff that employers comply with the legislation.

Once the government sets the wage floor at \( \bar{w} \), firms move up the labor demand curve and employment falls to \( \bar{E} \). As a result of the minimum wage, therefore, some workers \( (E^* - \bar{E}) \) are displaced from their current jobs and become unemployed. In addition, the higher wage encourages additional persons to enter the labor market. In fact, \( E_u \) workers would like to be employed, so additional \( E_u - E^* \) workers enter the labor market, cannot find jobs, and are added to the unemployment rolls.

Therefore, a minimum wage creates unemployment both because some previously employed workers lose their jobs and because some workers who did not find it worthwhile to work at the competitive wage find it worthwhile to work at the higher minimum. The unemployment rate, or the ratio of unemployed workers to labor market participants, is given by \( (E_u - \bar{E})/E_u \). This unemployment persists because the participants in the labor

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18 Other provisions of the FLSA include an overtime premium for persons who work over 40 hours a week and regulations on the use of child labor.

market have no incentives to alter their behavior: Firms do not wish to hire more workers and unemployed workers want to work at the minimum wage. The unemployment rate clearly depends on the level of the minimum wage, as well as on the elasticities of labor supply and labor demand. It is easy to verify that the unemployment rate is larger the higher the minimum wage and the more elastic the demand and supply curves.

Presumably, minimum wages are imposed so as to raise the income of the least skilled workers in the economy, for whom the competitive wage would be relatively low. As a result of the minimum wage, however, these workers now become particularly vulnerable to layoffs. The unskilled workers who are lucky enough to retain their jobs benefit from the legislation. The minimum wage, however, provides little consolation to the unskilled workers who lose their jobs.

**Compliance with the Minimum Wage Law**

This standard model of the impact of minimum wages assumes that all firms comply with the legislation. There seems to be a great deal of noncompliance with the minimum wage law. In 2001, for example, 3.1 percent of workers paid an hourly wage earned $5.15 or less per hour, and 71 percent of those workers were paid less than $5.15.20

The reason for this very high rate of noncompliance is that firms caught breaking the law face only trivial penalties. When a minimum wage violation is detected by one of the enforcement agents in the Employment Standards Administration of the Department of Labor, the government typically attempts to negotiate a settlement between the firm and the affected workers. As part of the settlement, the firm agrees to pay the workers the difference between the minimum wage and the actual wage for the last two years of work. Apart from the recovery of back pay, punitive damages are rare.

In effect, firms that break the law and are caught by the government receive an interest-free loan. They can delay paying a portion of their payroll for up to two years. Moreover, firms that break the law and are not caught (which probably include the vast majority of cases) can continue hiring workers at the competitive wage. The greater the degree of noncompliance with the legislation, the smaller the employment cut resulting from the minimum wage and the lower the unemployment rate.

**The Covered and Uncovered Sectors**

The model summarized in Figure 4.19 also assumes that all workers are covered by the legislation. As noted above, only 43 percent of nonsupervisory workers in the economy were in the covered sector when the FLSA was first enacted. The size of the covered sector, however, has increased over time, so that the legislation now covers most workers.

To see how the adverse employment effects of minimum wages may be moderated by less-than-universal coverage, consider the labor markets illustrated in Figure 4.20.21 There are two sectors in the economy, the covered sector in Figure 4.20a and the uncovered sector in Figure 4.20b. Prior to the imposition of a minimum wage, there exists a single equilibrium wage, \( w^* \), in both markets (determined by the intersection of the supply curve \( S_C \) and the demand curve \( D_C \) in the covered sector, and the intersection of \( S_U \) and \( D_U \) in the uncovered sector). The minimum wage is imposed only on workers employed in the industries that comprise the covered sector. Workers employed in the uncovered sector are left to the mercy of the market and will receive the competitive wage.

Once the minimum wage is imposed on the covered sector, the wage rises to \( \bar{w} \) and some workers lose their jobs. Covered sector employment falls to \( \bar{E} \) and there are \( E_C - \bar{E} \) displaced workers in the covered sector. Many of the displaced workers, however, can migrate to the uncovered sector and find work there. Some of these workers migrate to jobs in the uncovered sector, the supply curve in this sector shifts to \( S'_U \) (as illustrated in Figure 4.20b). As a result, the uncovered sector wage declines and the number of workers employed in the uncovered sector increases from \( E_U \) to \( E'_U \).

However, this is not the only possible type of migration. After all, some workers initially employed in the uncovered sector might decide that it is worthwhile to quit their low-paying jobs and hang around in the covered sector until a minimum-wage job opens up. If many workers in the uncovered sector take this course of action, the direction of migration would then be from the uncovered to the covered sector. The supply curve in the uncovered sector would shift to \( S''_U \) in Figure 4.20b, raising the uncovered sector wage.

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The analysis in Figure 4.20 shows how the free entry and exit of workers in and out of labor markets can equilibrate real wages in an economy despite the intentions of policy makers. In fact, if workers could migrate from one sector to the other very easily (that is, costlessly), one would expect that migration would continue as long as workers expected one of the sectors to offer a higher wage. The migration of workers across the two sectors would stop when the expected wage was equal across sectors.

To see this, let’s calculate how much income a worker who enters the covered sector can expect to take home. Let \( \pi \) be the probability that a worker who enters the covered sector gets a job there, so that \( 1 - \pi \) is the probability that a worker in the uncovered sector is unemployed. If the worker lands a minimum wage job, he gets wage \( w_c \); if he does not land a job, he has no income (ignoring any unemployment compensation). The wage that a person who enters the covered sector can actually expect to get is then given by:

\[
\text{expected wage in covered sector} = (\pi \times w_c) + [(1 - \pi) \times 0] = \pi w_c
\]

or a weighted average of the minimum wage \( w_c \) and zero.

The worker’s alternative is to enter the uncovered sector. The wage in the uncovered sector is set by competitive forces and equals \( w_U \). Because there is no unemployment in the uncovered sector, this wage is a “sure thing” for workers in that sector. Workers will move to whichever sector pays the highest expected wage. If the covered sector pays a higher expected wage than the uncovered sector, the flow of workers to minimum wage jobs will lower the probability of getting a job, increase the length of unemployment spells, and decrease the expected wage. In contrast, if the wage is higher in the uncovered sector, the migration of workers to that sector shifts the supply curve outward and lowers the competitive wage \( w_c \). As a result, the free migration of workers across sectors should eventually lead to:

\[
\pi w_c = w_U
\]

so that the expected wage in the covered sector equals the for-sure wage in the uncovered sector.

The discussion suggests that factors that influence the probability of landing a minimum-wage job help determine the direction of the migration flow between the two sectors. Suppose that workers who get a minimum wage job keep it for a long time. It is then difficult for a person who has just entered the covered sector to obtain a job. An unemployed worker, therefore, quickly recognizes that she is better off working in the uncovered sector where wages are lower, but jobs are available. If the persons who hold minimum wage jobs are footloose (so that there is a lot of turnover in these jobs), there is a high chance of getting a minimum wage job, encouraging many workers to queue up for job openings in the covered sector.

**Evidence**

The simplest economic model of the minimum wage predicts that as long as the demand curve for labor is downward sloping, an increase in the minimum wage should decrease employment of the affected groups. A large empirical literature attempts to determine if this


\[25\] There also exists a subminimum wage. Employers can pay teenage workers 85 percent of the minimum wage in the first three months of the job, as long as the worker is engaged in on-the-job training activities. This provision of the legislation reduces the price of younger unskilled workers relative to the price of older unskilled workers. Employers might then reevaluate their existing mix of labor inputs in order to take advantage of the now-cheaper youth workforce. However, only about 1 percent of employers use the subminimum wage; see David Card, Lawrence F. Katz, and Alan B. Krueger, “Employment Effects of Minimum and Subminimum Wages: Panel Data on State Minimum Wage Laws,” Industrial and Labor Relations Review 47 (April 1994): 467–497.
measure of the real minimum wage, after adjusting for other variables that could potentially affect teenage employment in that year. The estimated elasticities, however, are extremely sensitive to the time period over which the correlation is estimated. During some time periods the elasticity estimate is quite small (nearly zero), while if one estimates the same correlation over other time periods, one obtains a much more negative elasticity.24

A number of recent studies have introduced a different methodology for estimating the employment effects of minimum wages by carrying out case studies that trace the employment effects of specific minimum wage increases. These studies often conclude that many of the recent increases in the minimum wage have not had any adverse employment effects. One of these recent studies surveyed a large number of fast-food restaurants in Texas prior to (December 1990) and after (July 1991) the imposition of the $4.25 minimum wage.27 Fast-food restaurants are a major employer of youths in the United States, and the minimum wage should have a particularly strong effect on youth employment in that industry. It turns out, however, that there was little change in employment in these establishments, and, if anything, many of the restaurants actually increased their employment.

The "revisionist" evidence also seems to suggest that teenage employment is not affected when states enact a minimum wage that is higher than the federal level. In July 1988, two years prior to the increase in the federal minimum wage, California raised its minimum from $3.35 to $4.25 an hour. Prior to the increase, about 50 percent of California's teenagers earned less than $4.25 an hour, so that many teenagers were obviously affected by the state-mandated raise. Nevertheless, it seems as if California teenagers did not suffer any employment loss when the higher state minimum wage went into effect.28

The best-known case study analyzes the impact of the minimum wage in New Jersey and Pennsylvania.29 On April 1, 1992, New Jersey increased its minimum wage to $5.05 per hour, the highest minimum wage in the United States, but the neighboring state of Pennsylvania did not follow suit and kept the minimum wage at $4.25, the federally mandated minimum. The New Jersey--Pennsylvania comparison provides a "natural experiment" that can be used to assess the employment impacts of minimum wage legislation.

Suppose, for example, that one contacts a large number of fast-food establishments (such as Wendy's, Burger King, KFC, and Roy Rogers) on both sides of the New Jersey--Pennsylvania state line prior to and after the New Jersey minimum wage went into effect. The restaurants on the western side of the state line (that is, in Pennsylvania) were unaffected by the New Jersey minimum wage, so that employment in these restaurants should have changed only because of changes in economic conditions, such as seasonal shifts in consumer demand for fried chicken and hamburgers. Employment in restaurants on the eastern side of the state line (that is, in New Jersey) were affected by both the increase in the legislated minimum as well as by changes in economic conditions. By comparing the employment change in the restaurants on both sides of the border, one can then "net out" the effect of changes in economic conditions and isolate the impact of the minimum wage on employment. In effect, one can use the differences-in-differences technique to measure the employment effect of minimum wages.

Table 4.3 summarizes the key results of this influential study. It turns out that the fast-food restaurants on the New Jersey side of the border did not experience a decline in employment relative to the restaurants on the Pennsylvania side of the border. In fact, employment in New Jersey actually increased relative to employment in Pennsylvania. The typical fast-food restaurant in New Jersey hired 0.6 more workers after the minimum wage increase than it did before the increase. At the same time, however, the macroeconomic trends in the fast-food industry led to a decline in employment of about 2.1 workers in Pennsylvania—a state that was unaffected by the minimum wage increase. The differences-in-differences estimate of the impact of the minimum wage on employment, therefore, was an increase of about 2.7 workers in the typical fast-food restaurant. Needless to say, if correct, this line of research raises important questions about how labor economists think about the economic impact of minimum wages.

We do not yet fully understand why the recent evidence differs so sharply from the evidence presented in the earlier literature, and why the implications of our simple—and sensible—supply and demand framework seem to be so soundly rejected by the data. One plausible reason is that the adverse effect of the minimum wage of employment is relatively small. It might then be hard to detect this effect in a rapidly changing economic environment. In other

<table>
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<tr>
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<th>Employment in Typical Fast-Food Restaurant (in full-time equivalents)</th>
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<tbody>
<tr>
<td></td>
<td>New Jersey</td>
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<tr>
<td>Before New Jersey increased the minimum wage</td>
<td>20.4</td>
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<tr>
<td>After New Jersey increased the minimum wage</td>
<td>21.0</td>
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<tr>
<td>Difference</td>
<td>0.6</td>
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Table 4.3 The Employment Effect of Minimum Wages in New Jersey and Pennsylvania


words, the “true” impact of the minimum wage on employment is close to zero, but sampling errors lead researchers to find either small positive or small negative effects.

It has also been documented that the survey data collected in fast-food restaurants for the New Jersey—Pennsylvania study may contain a great deal of measurement error. For example, if one replicates the study using the employment data actually reported by the establishments, as opposed to survey data collected by researchers, the employment effect of the minimum wage in the New Jersey—Pennsylvania experiment is no longer positive, but either zero or slightly negative.30

Moreover, by focusing on employment in fast-food restaurants, these case studies may not provide a complete picture of the employment effects of minimum wages. After all, these establishments might use a production technology where the number of workers is relatively fixed (one worker per grill, one worker per cash register, and so on). As a result, the minimum wage might not reduce employment in existing restaurants, but might discourage the national chain from opening additional restaurants (as well as accelerate the closing of marginally profitable restaurants). Economies of scale might also “shelter” fast-food restaurants from the minimum wage. The minimum wage would then accelerate the decline of the smaller mom-and-pop restaurants, and fast-food restaurants might even “thrive” as a result of the minimum wage.

Finally, the before-and-after comparisons of employment in affected firms are also affected by the timing of these comparisons. Employers may not change their employment exactly on the date that the law goes into effect, but may instead adjust their employment slowly as they take into account the mandated increase in their labor costs. In fact, a careful study of the impact of minimum wages in the Canadian labor market shows that the employment effects of the minimum wage are smaller when one compares employment just before and just after the increase in the minimum wage takes effect, and becomes more negative the longer the period over which the employment data are observed.31

Is the Minimum Wage an Effective Antipoverty Program?
The minimum wage increases the wage for workers at the bottom of the wage distribution, but may reduce employment opportunities for some of those workers. The trade-off between wage increases and potential employment losses raises questions about the effectiveness of the minimum wage as an antipoverty tool.32 This trade-off could be overlooked if the


employment losses are “small,” and if the benefits from the higher minimum wage accrued mainly to poor persons. But recent studies raise some questions about the effectiveness of the minimum wage as an antipoverty tool by noting that the main beneficiaries of the minimum wage are workers in better-off households.33

The minimum wage in the United States rose from $3.35 to $4.25 an hour between 1991 and 1992. In 1990, only about 7.1 percent of the workers in the labor force earned between $3.35 and $4.25 an hour and hence could potentially benefit from the increase in the minimum wage. Many of these workers, however, are teenagers from households that are not poor. The relatively low wage earned by these teenagers in 1990 has little to do with the economic status of their families and their own long-run economic opportunities. It turns out that only about 19 percent of the increase in income generated by the

higher minimum wage accrued to poor households—households with annual incomes below the poverty line—and over 50 percent of the income increase went to households with incomes that were at least twice the poverty threshold. The evidence, therefore, suggests that even if the minimum wage has few adverse employment effects, it is not an effective way of combating poverty in the United States. For the most part, the benefits accrue to workers who are at the bottom of the distribution of *permanent* income opportunities.

**The Living Wage**

An increasing number of cities in the United States have enacted “living wage” ordinances. These laws typically set minimum wages that are far above the federal minimum and cover municipal employees or workers in firms that have business dealings with the city. As of December 2002, the living wage was $8.70 (per hour) in Ann Arbor, MI; $10.25 in Boston, MA; $10.86 in New Haven, CT; and $10.36 in San Jose, CA.

Although the living wage ordinances are relatively recent, a number of studies have attempted to measure the impact of this type of minimum wage on wages and employment in the affected localities. Few workers are covered by this type of legislation, so one might suspect that it would be difficult to detect any economic impact of the higher local minimum wage. Surprisingly, some studies report sizable impacts. An analysis of over 90 living wage ordinances indicated that the presence of a living wage ordinance in a locality reduced the probability of employment for persons at the bottom of the wage distribution by as much as 5 percentage points. Despite this adverse employment effect, the much higher wage associated with the living wage reduced the probability that family income in the locality fell below the poverty threshold.

### 4.11 Adjustment Costs and Labor Demand

The model of labor demand derived in this chapter assumes that firms instantly adjust their employment when the economic environment changes. A firm wishing to adjust the size of its workforce, however, will typically find that it is costly to make quick changes. A firm laying off a large number of workers, for instance, will certainly incur substantial costs when the experience and knowledge of those workers vanishes from the production line. A firm wishing to expand employment (perhaps in response to an increase in output price) will find that hiring additional workers might be equally costly: the firm will have to process the job applicants through the personnel office and train the new workers. The expenditures that firms incur as they adjust the size of their workforce are called *adjustment costs*.

There are two types of adjustment costs: *variable* adjustment costs and *fixed* adjustment costs. Variable adjustment costs depend on the number of workers that the firm is going to hire or fire. For example, the costs of training new workers obviously depend on whether the firm hires 1 or 10 workers. In contrast, fixed adjustment costs do not depend on how many workers the firm is going to hire or fire. Some of the expenses incurred in running a personnel office are independent of the number of job applicants or of the number of pink slips that the office might be processing.

Let’s initially consider the firm’s employment decisions in the presence of variable adjustment costs. Figure 4.21 illustrates one possible shape for the firm’s variable adjustment cost curve. It costs the firm $C_v$ dollars to hire an additional 50 workers. It also costs the firm $C_f$ dollars to fire 50 workers. As drawn, it costs more to fire than to hire. This asymmetry might arise because of government policies that mandate employers to provide severance pay for workers who are laid off.

The variable adjustment cost curve illustrated in Figure 4.21 also incorporates the important assumption that the adjustment costs rise at an increasing rate, regardless of whether the firm is contracting or expanding. In other words, the marginal cost of adjustment (that is, the costs associated with hiring or firing an additional worker) is higher for the 50th worker hired than for the 25th worker hired. Similarly, the costs associated with handing out the 50th pink slip are lower than the costs associated with handing out the 50th pink slip.

It is easy to describe what happens to the firm’s employment as the firm attempts to hire or fire additional workers in the presence of variable adjustment costs. Suppose, for instance, that the price of the output increases and that the firm expects this price increase to continue indefinitely. We know that the increase in output price will induce the firm to increase its employment from, say, 100 workers to 150 workers. Because it is costly to make an immediate transition to a new equilibrium, the firm will proceed slowly in hiring.

FIGURE 4.21  Asymmetrical variable adjustment costs

Changing employment quickly is costly, and these costs increase at an increasing rate. If government policies prevent firms from firing workers, the costs of trimming the workforce will rise even faster than the costs of expanding the firm.

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