University Avenue Undergraduate Journal of Economics

Volume 2 | Issue 1 Article 5

1998

The Minimum Wage in America Will Current Legislation Really Help the Working Poor?

Douglas A. Noe
Bradley University

University Avenue
UNDERGRADUATE JOURNAL OF ECONOMICS

The Minimum Wage in America

Will Current Legislation Really Help the Working Poor?

Douglas A. Noe
Bradley University
April 28, 1997

INTRODUCTION

In 1996, the United States Congress passed an amendment to the Fair Labor Standards Act of 1938 that will increase the federal minimum wage in two stages from $4.25 per hour to $5.15 per hour. The intent of this legislation is to reverse the decline of the real minimum wage in an effort to aid the working poor. However, such legislation is brought into question by traditional economic theory. The competitive model of the labor market clearly reasons that an increase in the wage level will result in increased unemployment. Recently, though, empirical studies such as those presented by David Card and Alan Krueger (1995) in a book entitled *Myth and Measurement* attempt to bring justification to the hike. Although recent studies conflict with conventional theories, their results should be viewed with caution. The theories and empirical evidence raised in recent years are not sufficient to disprove conventional wisdom; increases in the minimum wage lead to increases in unemployment, and such legislation is not effective in benefiting the collective working poor.

I. LABOR MARKET MODELS

A. The Standard Model

We shall begin our discussion with a review of the standard minimum-wage model--the competitive labor market. General economic theory postulates that, all else being held constant, the wage rate and the quantity of labor demanded in an industry are inversely related. Thus, if a minimum wage is imposed above the natural equilibrium wage in a labor market, then employment is reduced. If the required wage increase is only effective in a few industries, then the excess supply of labor will be forced to other industries, where wages then feel downward pressure. On the other hand, if the minimum covers all industries, then some unemployment in the total labor force will result (see Figure 1) (Peterson, 1969).

However as Kenneth Gordon (1981) notes, the modeled view of unemployment does not exactly match the commonly gathered labor statistic. If wages are increased in a single industry, for example, workers who are able to find work in other fields are not counted as unemployed. In addition, some previously non-participating workers, who are attracted to the labor market by the increased wage, will be unable to find jobs; however, they will not be counted as unemployed, since occupational unemployment statistics only include experienced workers. Thus, the effects of increased floor wages on unemployment are greatly understated in statistical analyses because collected unemployment statistics do not match their conceptual meaning.

Although abstract economic theory is not specific about the exact position and slope of any particular labor demand curve, empirical measures of wage elasticity can be useful in predicting the effect of an increase in the mandated floor wage. In this case, "elasticity" would refer to the ratio of the percentage change in employment to the percentage change

in the wage rate resulting from movement between points on the demand curve (Peterson, 1969).

Supporters of minimum-wage legislation contend that empirically, elasticity is near zero: employment levels do not decline as a result of higher wage rates. Those in opposition to this view contend that the wage elasticity of labor is much higher in absolute value, even approaching one or greater. In the controversy, deviation from unit elasticity is significant, because only if the demand for labor is relatively inelastic will total payrolls rise as a result of minimum-wage rate increases; in the case where the elasticity is greater than one, total payrolls decrease, and laborers incur a net cost (Peterson, 1969).

Because the wage elasticity of labor demand is so critical to cost-benefit analysis of the minimum wage, one finds it proper to examine the determinants of labor demand elasticity. Two concepts are essential to properly understand the magnitude of the wage elasticity of labor. First, the demand for factors of production, including labor, is derived from the demand for an end product. Also, labor is but one of many resources which are utilized in producing this product (Peterson, 1969).

The law of demand implies that every industry faces a downward-sloping demand curve. In any industry, an increase in wages places upward pressure on product prices, leading to decreased output. Because output falls, employment is reduced. Thus, the inverse relationship between an industry's product price and output leads to an inverse relationship between the industry's wage rate and demand for labor (Peterson, 1969).

The connecting element between product demand and the demand for labor in an industry is cost. Because wage increases raise the cost of an industry's factors of production, prices tend to rise. Thus, if an industry's payroll totals are a relatively large portion of their total factor costs, mandatory wage increases could have a dramatic effect on price levels. On the other hand, if labor comprises only a small part of an industry's cost structure, then the same wage increase would have a much lesser effect. In this way, the more labor-intensive industries naturally have more elastic labor demand curves (Peterson, 1969).

Many proponents of minimum-wage legislation assert that any additional costs generated by a minimum-wage increase will simply decrease profits. Although this condition may hold true in the short run, investors will eventually realize that long-term profitability also decreases, and they will adjust their behavior accordingly. Investors may find more profitable investment opportunities in other industries, or they may demand a change in operations, such as a substitution of capital in place of labor (Peterson, 1969). Also note that in the long run, firms have greater opportunities to implement these substitutions, so long-run elasticities may be even higher. Thus, in the long run, a minimum-wage increase should have the effect of decreasing employment in an industry.

The demand for labor can also be affected by the relative proportion of labor to the other resources used in production. Minimum-wage supporters assume that the mix of resources in a production process is technologically fixed; the proportions of labor and

capital resources cannot be changed. In this case, the wage elasticity of labor demand will be directly proportional to the elasticities of the supplies of other factors of production. As the supply of other resources becomes more elastic, labor demand becomes much more sensitive to changes in the wage rate. However, if the supply of production factors is rather inelastic, the reduction in output required by an increase in labor costs prompts a drop in the prices of other factors of production. In this case, the increased cost of labor is offset, at least in part, by the decreased cost of other factors of production. In this way, the effects on total output and unemployment are reduced (Peterson, 1969).

On the other hand, if technology does not require a particular mix of labor and other factors of production, firms counter a wage increase by decreasing the proportion of labor used in production. The obvious shift in factors of production would be from labor to physical capital, such as higher-productivity machinery. However, other resources may also be at a firm's disposal. For instance, higher-quality raw materials may be utilized, or increased management services including supervision, training, and planning could be employed. One should note that this factor substitution does not completely offset the cost of the initial minimum-wage increase; since the use of other factors has increased, their costs have increased as well. Thus, the greater the ability to implement factor substitution in an industry, the greater will be the wage elasticity of labor demand (Peterson, 1969).

Thus, the standard model of the labor market concludes that increases in the minimum-wage rate will inevitably lead to decreases in employment. In addition, the standard model is clear in stating that only when the wage elasticity of labor demand is less than one will an increase in the minimum wage lead to a net benefit (in terms of increased total payroll) to laborers. Thus, while the model leaves open the possibility that the sacrifices of the few may benefit the whole, it is clear that in a theoretical sense, a rise in the minimum wage will result in an increase in unemployment.

B. Alternative Models

Having solidified the conclusion of the competitive labor market model that a minimum-wage increase inevitably leads to increased unemployment, we shall now explore some alternative models used to justify minimum-wage increases. In each of these models, small wage increases may actually lead to increased employment. In these models, employment would increase at the same time as the hourly wage rate, so a net benefit to laborers would be realized.

1. The Shock Model

First, we shall examine the shock model of the labor market. Here, we accept the concept of the downsloping demand curve; however, we also assume that demand for labor will increase in response to a mandatory wage increase. This response arises because management lacks sufficient incentive to continually seek the most efficient methods of production. Thus, an increase in wages shocks the market, causing managers to employ more efficient methods to cut costs. In this way, the increased wages induce higher

productivity, thus shifting the demand for labor outward. So, an increase in the minimum wage may in fact increase employment, and even reduce the unemployment rate (Peterson, 1969).

The rationale underlying the shock model is questionable. Peterson (1969) argues that while firms within an industry may behave this way in isolated instances, generalization of this behavior to all firms is ridiculous. He notes: "It would be hard to explain why previous shocks of all kinds--wage, tax, and other changes--had not already exhausted all potential efficiency gains of this sort". Moreover, this model offers no means to quantify gains and no conditions under which such gains would be realized. The model is ambiguous as well in its results--it avoids contradiction. Depending on the relative shifts of the labor demand curve and the minimum- wage level, a change in employment level (there need not be a change at all!) may move in a positive or negative direction (see Figures 2a , 2b , 2c , 2d). Such an ambiguous model may seem useless, but Peterson concedes that the model may be intended simply to show that relatively small wage shocks have the potential to increase employment; thus, unemployment increases are not definite.

2. The Monopsony Model

Now, we shall consider the monopsony model. This model reverses the monopoly concept of one supplier and introduces the idea of a single buyer or group of collusive buyers. Because there is virtually only one entity utilizing the labor market, it faces the upward-sloping supply of labor in the industry. Thus, an employer is not threatened with a complete loss of its labor force if its wage level is reduced, and the firm may also attract additional workers if its wage is increased. However, since the marginal cost of employing labor grows faster than the average cost of labor, and the firm maximizes its profit when its marginal revenue product of labor is equal to its marginal cost of labor, the average wage required to attract its profit-maximizing level of labor is less than the marginal revenue product of labor. In this way, employment is constrained (Peterson, 1969).

Extending the logic of this model, the imposition of a mandatory minimum wage will result in an expansion of employment (see Figure 3). In effect, the minimum-wage level creates a horizontal supply curve, so average and marginal costs of labor are equivalent. In this way, the size of the labor force may change without an accompanying wage change. Therefore, the profit- maximizing level of employment is that where the wage level is equal to the marginal revenue product of labor, and this employment level is full employment (Peterson, 1969).

If a monopsonist chooses the size of its labor force with respect to a profit-maximizing objective, increases in the minimum wage, up to a point, will actually increase the employment level. Mandatory wages above this point, however, will result in a decrease in employment (as the traditional downsloping demand curve would predict). Thus, under the assumptions of the monopsony model, carefully administered minimum-wage increases will result in increased employment and production--both considered benefits to

the economy (Peterson, 1969).

Unfortunately, environments satisfying the assumptions of the monopsony model are scarce empirically. Peterson (1969) notes that empirical evidence fails to support significant existence of monopsony conditions, particularly for low-wage, low-skill industries where a minimum wage would have its greatest impact. In addition, he asserts that national competitors may face varying local labor supply elasticities unrelated to mandated wage levels. Thus, the employment prediction power of the monopsony model applied to American low-wage industries is rather low. In addition, the model's underlying theory only reveals the employment effects for surviving firms. However, as the industry adjusts toward long-run equilibrium, there must be an overall decrease in the number of firms. Therefore, total employment must still decrease.

3. The Vertical Demand Model

The final model we shall explore is the vertical demand model. This model may be useful in special circumstances that restrict the ability of firms to adjust employment levels. The labor demand in the model is perfectly inelastic for a bounded range of wages, and the usual downsloping demand is only realized outside of this range. Such a situation may exist in an oligopolistic market, where each firm believes its competitors will match price decreases but not price increases. In this way, product demand is bent, and the firm's marginal revenue curve (and thus labor demand curves) includes discontinuous jumps (see Figure 4) (Peterson, 1969).

The major problem with this argument rests in the blanket condition of minimum-wage legislation. Under a mandatory wage increase, *all* firms are required to meet the wage floor. Under formal or informal collusion, the firms may agree to increase product price, thus reducing output, and in turn, employment.

Another possible rationale for competitive firms is that average cost curves are nonincreasing. Output increases may lead to declining or constant average costs, but this curve must cease at some absolute capacity. In this way, the model assumes that marginal costs cannot rise at full capacity; therefore, the firm's cost curve becomes vertical. Because the cost curve becomes vertical, the demand for labor must fall vertically at capacity as well. In other words, when the firm is producing at capacity, labor demand is fixed. "It implies, of course, that the firms operate only at capacity or that competition is very imperfect, and it also does not take account of the industry effect of a wage increase for all firms" (Peterson, 1969). Many other arguments in favor of the vertical demand model may exist, but it is unnatural to expect the conditions of any of these models to apply to a majority of industries at any given time.

C. Conclusion - Part I

We have examined the standard competitive model of the labor market and three alternatives. The competitive model, which appears to have the most reasonable assumptions, unequivocally concludes that a rise in the wage floor will lead to an

increase in unemployment. The other three models-- shock, monopsony , and vertical demand --provide theoretical environments for the coincidental increases of the minimum-wage level and employment. While the assumptions of these alternatives are often questionable, their conclusions provide fuel for the minimum-wage debate.

II. THE DEBATE IN THEORY

The theoretical debate over the minimum wage is not limited to the scope of the models presented in Part I . Many arguments both in support of and in opposition to the minimum wage arise from considerations not present in our simplified labor market models. Topics discussed include the effects of minimum-wage increases on productivity and the distribution of income. We shall present the theoretical arguments in favor of the minimum-wage increase, and then examine arguments in opposition to the legislation.

A. The Productivity Argument

Many economists believe that those who oppose increases in the minimum wage have lost sight of long-run effects. They concede that short-term employment losses will result from an increase in the minimum-wage level as firms begin to substitute capital for the relatively more expensive labor. However, they assert that this increased capital investment will result in more rapid technological advances and increased productivity. In this way, proponents of the minimum wage believe that increases may bring long-run benefits to the economy.

This phenomenon is known as the "Webb effect," named for economist Sidney Webb, who first presented the idea. The Webb effect states that long-term economic growth will result from the elimination of low-productivity firms and from increased productivity of surviving firms. Some economists propose that minimum-wage increases should be imposed regularly to give firms a continual incentive to develop and implement new higher-productivity technologies. The argument continues that jobs lost from the elimination of marginal firms will be somewhat offset as higher-productivity firms expand to meet unsatisfied market demand. The combined effects of this expansion and the development and implementation of new technologies will result in an increase in the total productivity of labor (Prasch, 1996).

B. A Rebuttal to the Productivity Argument

Although the long-run productivity argument is accepted by many economists who support minimum-wage legislation, contradictory arguments may be presented. As J. Huston McCulloch (1981) notes in his rebuttal, the mechanics of labor-capital substitution are often viewed as too automatic. Instead, he explores the effects a minimum-wage increase may have on capital investment, and the long-run implications these effects have on the economy.

In a competitive labor market, the wage that is given to labor is directly related to its marginal product. The marginal product of labor decreases as the ratio of labor to other

factors of production rises, and it generally increases as this ratio decreases. Suppose the only factors of production available to the economy included labor and a fixed plot of land. If the population continually grew, then the real marginal product of labor would be forced downward as time passed. In this way, real wages would have to fall in order to maintain full employment, and a fixed real minimum wage would result in continually growing unemployment. Moreover, because land-held exhaustible resources are so vital to the economy, a falling marginal product of labor would even result under conditions of zero population growth (McCulloch, 1981).

Our true economy has sustained growing real wages and controlled unemployment even with a growing population and declining natural resources. The explanation for this phenomenon is a rapid accumulation of capital. Capital has increased in the economy in a much greater proportion than the population, and this increase has more than offset the per capita decline in land and other natural resources. The increasing productivity of labor that is typically credited with the growth of our economy can in part be explained by improved methods of training. However, as McCulloch (1981) notes, "to a large extent it is not due to labor at all, but rather to the increasing amount of capital that labor has to work with."

McCulloch (1981) concedes that at a given level of capital, a legally imposed minimum-wage increase will initially benefit those workers who maintain their jobs. However, taking into account the effects of increased wages on capital formation, the long-term effects on this group remain ambiguous. Investment in capital will only result from a belief that such an investment will be profitable. An increased minimum wage decreases the profitability of investment, and in turn reduces the incentive to purchase capital. Thus, an overall decline in the capital stock will result in the long run; in turn, the marginal product of labor will fall below what it would have been without the legislation.

Arguments have been presented that this decline in the capital stock would be so extreme that the quality-adjusted marginal product of labor will settle exactly where it would have been without the minimum wage. Thus, the workers who remained employed after the wage increase would eventually lose their entire short-run gain prior to taxes. Taking taxes into consideration, they could actually be in a worse position if they were required to pay higher taxes to support those who initially became unemployed as a result of the minimum-wage increase. Thus, short- run gains from a minimum-wage increase will be nullified or even reversed in the long run (McCulloch, 1981).

C. The Income Distribution Argument

The second argument in favor of the minimum wage that often arises relates to the wage's effect on the distribution of income. Proponents of minimum-wage legislation assert that its impact on income distribution increases the level of realized demand. The argument continues that this demand increase directly contributes to economic growth.

Prasch (1996) contends that the traditional argument against the minimum wage ignores "feedback effects" from the whole economy. Instead, the usual argument merely focuses

on business costs, and implicitly assumes that aggregate demand and business revenues are fixed. These assumptions may have been derived from Say's Law, which implies a fixed level of effective demand. However, Prasch contends that Say's Law is merely a consequence of the general equilibrium model, and has not been empirically demonstrated. Therefore, theory surrounding the effects of a minimum-wage increase should consider the effects of a resulting change in the distribution of income.

Prasch (1996) asserts that economists who oppose the minimum wage have overlooked the fact that increasing the minimum wage "will transfer purchasing power from profits, perks, and overheads" to low-wage earners. In post-Keynesian theory, a relatively even distribution of income leads to an increase in the total quantity of spending. As the demand for goods rises, business volume and business revenue will rise as well. In short, this increase in volume leads firms to invest in additional capital. Increases in productivity, employment, and economic growth then follow.

D. A Rebuttal to the Income Distribution Argument

A slightly different approach to the income equality question of the minimum wage is presented by J. Huston McCulloch (1981) in *The Economics of Legal Minimum Wages*. McCulloch models the economy as consisting of three groups: (1) unskilled workers who lose jobs or must seek work in an uncovered sector of the economy as a result of a minimum-wage increase, (2) unskilled workers who retain their jobs after the increase and receive higher wages, and (3) a group including skilled workers and owners of other factors of production.

The model reveals that the second group's share of total income increases at the expense of the other two groups. However, since the groups incurring costs are at the extremes, a purely qualitative analysis leads to ambiguity. The second group is pulled closer to the third while simultaneously being pushed farther from the first. Thus, the overall effect of a minimum-wage increase on income equality cannot be determined without some specific measure (McCulloch, 1981).

For this purpose, McCulloch (1981) evaluated outcomes of the model with the Gini index of equality. The indications of the Gini index vary as different simplifying assumptions regarding production technology are used. The author finds that the effect of a minimum wage on the index may be either positive or negative. However, for "the most plausible" values for technology parameters, the effect of the floor-wage increase on income equality is a net decrease. Thus, the improved condition of the second group with respect to the third is more than offset by the dwindling position of the first. Therefore, the minimum wage is not effective in achieving a more even income distribution. Thus, in the scope of Prasch's (1996) argument, the effective level of aggregate demand would fail to increase, and increased economic growth would not be an end result.

E. Conclusion - Part II

The debate over the effects of minimum-wage legislation extends beyond the scope the

short-run unemployment issue discussed in Part I . Instead, factors influencing the long-run growth of the macroeconomy are discussed. Productivity and income distribution concerns are raised, and because these characteristics are not easily modeled, theoretical discussions provide many conflicting viewpoints.

These conflicting results impose difficulty on those trying to approach the real issue of the minimum wage: its effects on poverty. It appears that no theory offers a definitive answer to the effectiveness of the minimum wage in achieving its ultimate goal of reducing poverty levels. For this reason, yet another debate has surfaced to address this issue--the empirical debate.

III. THE EMPIRICAL DEBATE

We have seen that the standard theoretical model of a competitive labor market generally implies that mandatory wage floors will increase unemployment. The question, according to John Peterson (1969) , is not whether employment will decrease, but whether the wage elasticity of labor demand will determine a net benefit or net cost to low-wage laborers. However, the recent empirical debate over the minimum-wage issue does not accept this formulation. Rather, studies have concluded that minimum-wage increases in various states have actually increased *employment*, in addition to lessening the grip of poverty. Thus, the empirical debate is divided into two areas: (1) the effect of the minimum wage on unemployment levels, and (2) the effectiveness of the minimum wage in battling poverty.

A. *Myth and Measurement*: the Center of the Debate

The most current body of literature surrounding the minimum-wage issue focuses on a recent work by David Card and Alan Krueger (1995) entitled *Myth and Measurement: The New Economics of the Minimum Wage*. This work is the culmination of several years of research by Card and Krueger surrounding the issue. Through the study of several state minimum-wage increases, the authors determined that, contrary to conventional economic theory, an increase in minimum-wage levels has no significant upward pressure on unemployment levels and in some cases actually appears to reduce unemployment. Card and Krueger even conduct a "meta- analysis" of past published minimum-wage studies, and assert that several factors as varied as fluctuating economic conditions and publishing biases contribute to their opposing conclusions. The research team suggests that the competitive model of the labor market is inadequate for describing the situation, and presents alternative models for consideration.

Of course, the results and theories presented in *Myth and Measurement* have caused significant controversy among modern economists. Each of the book's studies has been challenged in an attempt to defend traditional theory. This paper will focus on two key sections of the book: the first dealing with the effects of a minimum-wage increase on teenage unemployment in the fast- food industry, and the second dealing with the ability of positive effects of a minimum-wage increase to alleviate poverty.

B. *Myth and Measurement* on Unemployment Effects

The first section of Card and Krueger 's *Myth and Measurement* (1995) that we shall discuss deals with the question of the effects of a minimum-wage increase on the teenage unemployment level. In Chapter 2, the authors present a study they compare to a "natural" scientific experiment. In 1992, the state of New Jersey implemented minimum-wage legislation which increased the value of the floor wage to $5.05 per hour. While this increase took effect, the neighboring state of Pennsylvania remained at the federal minimum of $4.25 per hour. In their econometric study, Card and Krueger gathered teenage employment and pricing data over the telephone from fast- food restaurants in both states. The authors treat the Pennsylvania restaurants as the "control" group, and the New Jersey restaurants as the "experimental" group. In this way, the authors contend they can gain a more insightful picture of the effects of the minimum wage on unemployment than in typical "uncontrolled" experiments.

Card and Krueger (1995) first structure their data as follows: they calculate the change in employment each restaurant realized from February and March of 1992 (after the legislation was passed but before it was clear it would not be repealed) to November and December of 1992, eight months after the wage increase took effect. Comparing the mean employment change in New Jersey with that of Pennsylvania, Card and Krueger find that teenage fast-food employment actually rose in New Jersey while it fell in Pennsylvania. In fact, the difference in these changes was statistically significant with a p-value of less than .05. Thus, Card and Krueger concluded that in spite of the minimum-wage increase, New Jersey teenage employment grew more (or decreased less) than in Pennsylvania.

The next part of the study regressed the change in employment at a restaurant against (1) a variable accounting for varying restaurant characteristics, (2) a dummy variable indicating whether the restaurant is located in New Jersey or Pennsylvania, and (3) a variable indicating the immediate wage rate change mandated by the minimum-wage increase. With statistical significance, the results of the study seem to contradict the predictions of the competitive labor market model, indicating that the change in employment in New Jersey was positive with respect to the change in Pennsylvania, and the required wage increase was positively related to an employment change. Thus, Card and Krueger (1995) conclude that a mandatory increase in the minimum wage does not have a negative effect on teenage employment, and may even have a small positive effect.

C. Rebuttals Concerning Unemployment

The most incriminating problem found in the Card and Krueger (1995) two-state study on the effects of the minimum wage on teenage unemployment is found in the type of data utilized. In a study conducted by David Neumark and William Wascher ("Of Magic, Myth and the Minimum Wage," 1995), payroll records were used to measure income levels rather than telephone survey results. Running regressions using these figures, they found that the increased minimum wage in New Jersey did in fact increase

unemployment. However, this initial study attracted criticism because it relied on a relatively small number of observations.

In a second study using a much larger data set, the research team found that the 19 percent increase in the New Jersey minimum wage reduced employment in fast-food restaurants by 4.6 percent. The pair supported these findings by conducting yet another study. Using state-wide figures for the entire dining industry, Neumark and Wascher ("Of Magic, Myth and the Minimum Wage," 1995) again found that the minimum-wage increase in New Jersey resulted in a decrease in jobs relative to Pennsylvania, in which no minimum-wage legislation was passed.

Thus, the study of the 1992 New Jersey minimum-wage increase presented by Card and Krueger (1995) in *Myth and Measurement* appears to have been flawed. Other studies presented in the book have fallen under similar criticism, being accused of using inappropriate data sets, inappropriate methods of collection, and including insufficient regression variables ("Of Magic, Myth and the Minimum Wage," 1995). However, as stated by an *Economist* contributor, "the impact of the Card and Krueger study . . . cannot be denied. It changed the terms of the minimum-wage debate, probably irreversibly. Now, it seems, the study was plain wrong."

D. *Myth and Measurement* on Poverty Effects

Now that we have discussed the conflicting viewpoints regarding the effect of the minimum wage on unemployment and employment levels, we shall introduce the arguments concerning the other side of the issue: the ability of the minimum wage to battle poverty. Even if minimum- wage legislation results in decreased employment or increased unemployment, it may have value if it improves the condition of the working poor. In Chapter 9 of *Myth and Measurement*, Card and Krueger (1995) present their analysis of the situation.

Card and Krueger (1995) begin their analysis with a description of the workers affected by the April 1990 California minimum-wage increase (from $3.35 to $4.25). They organize this data by family income deciles. In this way, every individual is placed into a category based on his or her family's total income. In this purely descriptive analysis, the authors find that while overall 7.2 percent of workers were affected by the minimum-wage increase, much larger proportions of workers in the lowest deciles were affected (28.8 percent in the lowest decile). Thus, Card and Krueger determine that "minimum-wage earners are disproportionately drawn from lower- income families."

After presenting this profile of the minimum-wage-earning community, Card and Krueger (1995) analyze the effects of the minimum wage on income distribution and poverty. Here, we shall focus on the poverty analysis, because the distribution discussion is simply an intermediate step to the end result. Card and Krueger found that although the imposition of a minimum wage tends to even out the distribution of income, it is not necessarily an effective tool in battling poverty. While the team did recognize decreases in poverty following a minimum-wage increase, their results were not statistically

significant. Therefore, Card and Krueger conclude that although there is no strong evidence that the minimum wage can reduce poverty, there is even less of an indication that it would worsen the conditions of the working poor.

E. Rebuttals Concerning Poverty Effects

While the Card and Krueger (1995) study may paint a far from unpleasant portrait of the ability of the minimum wage to improve the situation of the poverty-stricken, a re-evaluation of this study may prove the authors wrong. In "`Who Gets What' from Minimum Wage Hikes," Richard V. Burkhauser, Kenneth A. Couch, and David C. Wittenburg (1996) scrutinize the *Myth and Measurement* study. The authors criticize the methods Card and Krueger employ to analyze income distribution effects of the minimum wage. They even accuse the team of failing to address the true focus of minimum-wage legislation--that those who work are rewarded by escaping poverty.

The first problem with the Card and Krueger (1995) study relates to their categorization of data. The family-income decile arrangement used fails to account for family size. In this arrangement, the poverty line is scattered among deciles. For example, an individual in the second decile of the distribution would have an income between $8000 and $13,559. If this individual lived alone, he or she would not fall below the poverty line, as his income-to-needs ratio could be as high as 2.35. On the other hand, if the individual supported a family with three children, they would all be poverty-stricken. Thus, an appropriate measure of an individual's well-being must account for the size of his or her family (Burkhauser, 1996).

Even with this inaccurate portrayal of the poverty level of minimum-wage workers, Card and Krueger (1995) use a convenient basis to arrive at desired results. Rather than calculating the percentage of *all* individuals aged sixteen and over in each decile that are affected by the minimum-wage increase, they focus simply on those individuals who are *working* within each decile. Thus, the proportions of affected parties in each decile are inflated, particularly in the lower deciles. Burkhauser, Couch, and Wittenburg (1996) replicate the Card and Krueger study using this alternate technique. In contrast to the lopsided results presented in *Myth and Measurement*, the authors find that the proportions of workers affected in each decile are much more even. The authors then conclude that "even if the negative employment effects of the minimum wage are small, it is still a very ineffective method of assisting the working poor."

Finally, Burkhauser, Couch, and Wittenburg (1996) address the issue of the floor wage's effects on poverty in a different way. They reorganize Card and Krueger's (1995) data based on family structure. Using family size and income, the team is able to calculate each person's income-to- needs ratio. They further subdivide the data using the hourly wage rate paid to each worker (three categories below the new minimum wage and three equal to or above). From this formulation, they find that a large majority (68 percent) of the working poor already earn more than the *new* minimum wage. Therefore, the increase will at most have only a small effect on the working poor, and an even smaller effect on the set of all poor families even under the most ideal circumstances. Under worse

circumstances, the wage increase could have a negative effect if the job losses resulting from the wage hike were concentrated among the working poor rather than among those who were not poor.

Thus, the *Myth and Measurement* (Card, 1995) studies of the effectiveness of the minimum wage in battling poverty have been attacked for several reasons. First, the studies fail to account for family structure and size when organizing their data. This fallacy leads to inaccurate perceptions of the distribution of the working poor. Next, Card and Krueger's choice to focus solely on working individuals in determining the segments of the population affected by the minimum wage produce unnecessarily lopsided results. Finally, while other studies support Card and Krueger's result that the minimum wage has no significant effect on the working poor, they do not imply that small favorable effects are likely.

F. Problems in Measuring Coverage

The empirical debate of the minimum wage has centered around *Myth and Measurement* (Card, 1995) and other studies which reveal unemployment effects and other effects contradicting traditional economic theory. Like Burkhauser (1996) , many researchers attempt to refute unorthodox results on the basis of methodology or data treatment. However, the issue is not exhausted by these two sides. Some economists are now questioning the validity of minimum- wage studies on the basis of inaccurate estimates of minimum-wage coverage.

William E. Spriggs and Bruce W. Klein (1994) discuss the matter in *Raising the Floor: The Effects of the Minimum Wage on Low-Wage Workers*. Spriggs and Klein contend that Bureau of Labor Statistics (BLS) data, commonly accepted as the most accurate count of minimum-wage workers, significantly underestimate the true number. The problem, the authors assert, is that the BLS data only include hourly minimum-wage earners, and exclude laborers paid weekly, monthly, or piecewise equivalents of the floor wage. According to Spriggs and Klein, "these nonhourly workers are (most likely) the vast majority of minimum-wage workers, and the minimum-wage law covers them to the same degree that it does their hourly paid counterparts."

If this notion is true, previous studies concerning the value of a minimum-wage increase are intrinsically biased. The size of the minimum-wage group, as well as the proportion of this group below the poverty level, has been drastically undercut. For instance, less than 20 percent of hourly floor-wage earners fall below the poverty line, but if nonhourly workers are included, that proportion increases to nearly 25 percent. In addition, nearly two-thirds of poor minimum-wage earners are the only working members of their families. Based on these statistics, working poverty is a more serious problem than typically discovered in empirical minimum-wage research (Spriggs, 1994).

G. Conclusion - Part III

The purpose of presenting these selected articles from *Myth and Measurement* (Card,

1995) was not simply to refute them. Rather, I hope to leave the impression that even the empirical side of the minimum-wage debate is far from settled. While the theoretical grounding of the minimum wage is in doubt, empirical studies have evolved to argue all sides of the issue. Understandably, because recorded unemployment statistics do not perfectly match the theoretical concept, varying statistical methods have produced contradictory results. In addition, the method of categorizing the working poor has been shown critical in analyzing the effects of the minimum wage on reducing poverty. Finally, the issue of the effective coverage of the minimum wage is in conflict. Thus, a researcher's choice of methodology and desired result (derived from either theory or political interest) will significantly affect the conclusions drawn from any study. In this way, the emergence of *Myth and Measurement*, in bringing forth the ultimate challenge to conventional wisdom, has prompted economists to re-evaluate not only their empirical methods but also the theories driving those methods.

While the empirical studies in *Myth and Measurement* (Card, 1995) focus on state minimum-wage increases, I will broaden my focus to the national economy. My study shall focus on the effects of the minimum wage on sixteen- and seventeen-year-old workers. Using the Koyck lag elasticity model, I shall attempt to show that changes in the real minimum wage and the unemployment rate of this group are directly related in both the short term and the long term.

IV. REGRESSION ANALYSIS

A. Data

My quarterly data are collected from the Bureau of Labor Statistics (BLS) and the Federal Reserve Economic Data (FRED) databases, and I shall represent them as follows:

> Unemp = the unemployment rate among sixteen- and seventeen-year-olds during the current quarter.
>
> RealMin = the real value of the minimum wage in 1992 dollars.
>
> CapCost = the real cost of capital, based on the real seven-year U.S. Treasury Bill rate.
>
> Prod = the business labor productivity index, indexed on 1992 productivity.
>
> $Unemp_{-1}$ = the unemployment rate among sixteen- and seventeen-year-olds during the previous quarter.

Data are available dating back to the 1950s. However, because industry coverage of the Fair Labor Standards Act increased dramatically over time until the late 1970s (Hart, 1994), I have chosen to include only figures from 1980 to 1995 for my analysis.

B. The Model

I will use this data to fit the following model:

where □is the population error term.

I have chosen the Koyck lag elasticity model because the unemployment effects of the minimum wage are not intuitively immediate. The ability of a firm to promptly adjust its cost structure following a minimum-wage increase is typically limited. Instead, the firms are only effectively able to change their *planned* relative proportions of labor and capital. Thus, current fluctuations in the minimum wage should have a greater impact on future unemployment rates than current unemployment rates. Similarly, the current unemployment rate is heavily affected by past fluctuations in the minimum wage. The Koyck lag model allows us to measure these delayed effects.

C. Expectations

The coefficient ( ) of ln RealMin should be positive. As we discussed in Part I, the competitive model of the labor market concludes that as real wages are pushed above equilibrium, unemployment will result. Because the economy sustains jobs that pay the minimum wage, the labor market equilibrium wage must be at least that low. Therefore, increases in the real value of the minimum wage will increase the teenage unemployment rate.

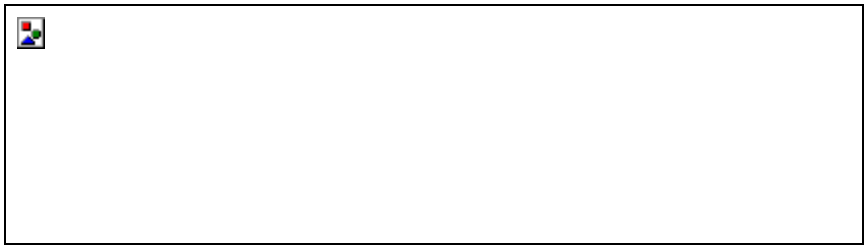
The coefficient ( ) of ln CapCost should be negative. As the real cost of capital increases relative to the cost of labor, firms will begin to substitute labor for other factors of production. In this way, labor demand increases; more workers are hired at each wage level. Therefore, the level of full employment increases, or unemployment decreases.

The coefficient ( ) of ln Prod should also be negative. As workers become more productive, the marginal revenue product of labor increases for each worker. Thus, the demand for labor increases at every wage level. This condition results in an increased level of full employment or a decrease in unemployment.

The coefficient ( ) of ln $Unemp_{-1}$ should be positive and less than one. The magnitude of the lag coefficient in the model represents the proportion of unemployment effects realized from previous adjustments to the real minimum wage. The assumption of the model is that the most recent quarter is the most influential, and that each prior quarter's influence declines geometrically by a factor of .

D. Regression Results

The regression provided the following fit to the model:



First, we shall examine the worth of the overall regression. We must first determine if any relationship exists between the unemployment rate of teenagers and the real minimum wage, real cost of capital, productivity, and historical fluctuations in these variables. We test the null hypothesis that the regression reveals no relationship between unemployment and these factors (F = 0) against the alternative that a relationship exists (F □0). Our F of 68.809 carries a p-value of less than .0001. So, testing at a level of significance less than .01 percent, we can conclude that a relationship exists between the young teenage unemployment rate and the other factors discussed. The R^2 value of .82844 reveals that approximately 82.8 percent of the variability of the unemployment rate of sixteen- and seventeen-year-olds can be explained by the real minimum wage, the real cost of capital, productivity, and historical changes in these factors.

Before we can examine our results further, we must check whether any residual autocorrelation resulted from the structure of the Koyck lag model. For this purpose, we use the Durbin's h statistic. In the case that residual correlation, □, is zero, the Durbin's h statistic may be approximated by the standard normal distribution. Thus, we may test the null hypothesis that there are no autocorrelated residuals (□= 0) against the alternative hypothesis that autocorrelation is a problem in the data set (-1 < □< 0 or 0 < □< 1). Our Durbin's h statistic of -1.126 carries a p-value of .260, which is not significant at any reasonable level. Thus, we are unable to detect a problem of autocorrelated errors in the data set.

Now, we may examine the effects of the individual regressors on the unemployment ratio. First, we shall inspect the term of greatest interest--the real minimum wage term. As expected, the sign of □□□is positive, which would imply that increases in the real value of the minimum wage result in increased young teenage unemployment. To verify this assertion, we test the null hypotheses of no wage effect (□□□= 0) against the alternative hypothesis of a positive wage effect (□□□> 0). Our t-statistic of 2.448 carries a p-value of .00875. Thus, testing at the .875 percent level of significance, we can conclude that increases in the real value of the minimum wage produce increases in the young teenage unemployment rate. In fact, we are 95 percent confident that a ten percent increase in the real minimum wage will result in an increase in the young teenage unemployment rate between .73 percent and 7.24 percent.

Next, we shall examine the importance of the second regressor, the real cost of capital. Its coefficient, , has a sign opposing expectations. Thus, we shall test the null hypothesis that there is no effect of the cost of capital (= 0) against an amended alternative hypothesis that there is an effect of unknown sign (= 0). Our t-statistic of 1.337 carries a p-value of .1866, so testing at the standard five percent level of significance, we cannot prove that the cost of capital has any effect on the unemployment rate of sixteen- and seventeen-year-olds.

We shall now examine the effects of the productivity of labor on the unemployment rate. The coefficient of this regressor, , is positive, contradicting our expectations. Thus, we shall test the hypothesis that the productivity of labor has no effect on the unemployment rate of young teenagers (= 0) against the amended alternative hypothesis that labor productivity has an unemployment effect of unknown sign (0). Here, our t-statistic of 1.489 has a p-value of .1419, indicating that we cannot find a labor productivity effect at the standard five percent level of significance.

Finally, we shall examine the importance of the final regressor, lagged unemployment. As expected, the coefficient has a value between zero and one. To test the significance of this regressor, we shall first test whether the coefficient is bounded above zero. We shall test the null hypothesis that = 0 against the alternative that > 0. Here, our calculated t-value is 10.514 with a p-value of less than .0001. Thus, testing at less than the .01 percent level of significance, we can conclude that the coefficient of the lagged teenage unemployment rate is positive. Now, we must demonstrate that the coefficient is bounded below one. We test the null hypothesis that = 0 against the alternative that < 1. Our calculated t-score here is -3.416, with a p-value of less than .001. Thus, testing at a level of significance less than .1 percent, we can conclude that some portion of the unemployment rate of young teenagers is determined by historical changes in the real minimum wage, the real cost of capital, and the productivity of labor. In fact, we are 95 percent confident that this portion is between 61.12 percent and 89.83 percent.

This relation between the historical changes in our independent regressors and the teenage unemployment rate has some interesting implications. Using our regression estimates of the lag coefficient and the wage elasticity of unemployment, the Koyck model allows us to construct an estimate for the long-run effects of the minimum wage on young teenage unemployment. The long-run minimum-wage elasticity of young teenage unemployment, E_{LR}, can be computed as follows:

Thus, using our estimates of (= .7548) and (= .3986) from the regression, we

obtain a long-run minimum-wage elasticity of teenage unemployment of 1.625. Therefore, while sixteen- and seventeen-year-old unemployment is inelastic with respect to the minimum wage in the short run, it is elastic in the long run.

In this way, while a ten percent increase in the real minimum wage causes an approximate 3.99 percent increase in the young teenage unemployment rate in the short run, this same increase has the long-term effect of increasing young teenage unemployment by 16.25 percent. Carrying this analysis a step further, because sixteen- and seventeen-year-olds comprise roughly 3.75 percent of the total labor force, the long-run minimum-wage elasticity of the overall unemployment rate has a rough lower bound of .0609. Thus, a ten percent increase in the real minimum wage will have a long-run effect of increasing unemployment by at least .609 percent of its current value.

E. Implications

Because such a large proportion of the changes in the teenage unemployment rate results from past fluctuations in the minimum wage, the causality of short-run effects is easily misinterpreted. Steady drops in the real value of the minimum wage rate over long periods of time (such as during much of the 1980s) place significant downward pressure on future unemployment rates. Thus, Card and Krueger's (1995) conclusion that their repeated studies indicate that increases in the minimum wage place no upward pressure-- and possibly even limited downward pressure-- on the unemployment rate is flawed. One- or two-year studies of the unemployment effects of the minimum wage are insufficient. An accurate portrayal of the ultimate effects of the minimum wage cannot be obtained without studying past fluctuations.

F. Conclusion - Part IV

This study appears to refute the contention of David Card and Alan Krueger (1995) that increases in the minimum-wage level do not significantly affect teenage unemployment. Through the analysis of nationwide time-series data, we have concluded that changes in the real value of the minimum wage have definite short-run and long-run impacts on the unemployment rates of sixteen- and seventeen-year-olds. In fact, our results indicate that while unemployment is inelastic with regard to the real minimum wage in the short run, it is much more elastic in the long run. Thus, while short-run effects of minimum-wage policy may appear minuscule, long- run effects are much more significant.

CONCLUSIONS

In Part I , we examined several labor market models to provide a theoretical basis for both sides of the minimum-wage issue. The generally accepted competitive model of the labor market asserts that minimum-wage increases must result in employment losses, and in turn, unemployment increases. However, the shock model, the monopsony model, and the vertical demand model all provide scenarios in which the minimum wage and

employment simultaneously rise. However, John Peterson (1969) notes that none of these scenarios can be generally applied to the macroeconomy. Thus, the standard competitive model of the labor market appears to provide the best description of the effects of minimum-wage policy on unemployment.

In Part II , we examine theoretical treatments of the minimum wage that extend beyond the scope of the simple models in Part I. The long-run productivity argument for the minimum wage and its effects on the distribution of income is certainly worthy of merit, but it is questioned by J. Huston McCulloch (1981) , who asserts that even the short-run benefactors of minimum-wage legislation will be hurt in the long-run. Thus, recent theoretical developments surrounding the minimum wage have not been successful in refuting conventional theory.

In Part III , we take a look at the empirical debate surrounding the minimum wage. This debate is centered around *Myth and Measurement*, a book authored by David Card and Alan Krueger (1995) , which challenges traditional minimum-wage studies. However, the results in any such work must be viewed with careful scrutiny. Several economists have critiqued the methods Card and Krueger used in their studies to collect and analyze data. The debate seems to have shifted from the minimum-wage issue to the empirical methods used to study the issue. Thus, recent empirical studies have not been successful in refuting conventional wisdom.

Finally, in Part IV , we conduct a simple analysis of macroeconomic data to determine if any nationwide unemployment effects can be determined by changes in the real minimum wage. Our results contradict the general theme of *Myth and Measurement* and bring support to the classical competitive labor market model. In addition to these short-run results, the Koyck lag model enables us to produce estimates for long-term minimum-wage elasticities of teenage unemployment. As expected, we find that while these wage elasticities of unemployment are rather inelastic in the short run, they become much more elastic in the long run.

These short- and long-run results may provide some insight into the difficulty with measuring unemployment effects of the minimum wage through "natural" experiments. Because short-term effects account for such a small proportion of current fluctuations in the unemployment rate, their sign and magnitude are skewed in simple regressions by more powerful long-term effects of previous changes. Models which focus solely on immediate effects, therefore, are flawed.

The recent flurry of minimum-wage studies has grown from political debate over the issue. Although the minimum wage is conventionally thought to be detrimental to low-wage earners, a single study such as Card and Krueger's *Myth and Measurement* has been used to support the politically popular minimum-wage increase. However, as our evaluation of economic theories and empirical studies (including our own) reveals, insufficient evidence exists to refute the traditional stance. Thus, new conflicting theories should be viewed with scrutiny. Minimum- wage legislation is not an effective means of improving the condition of the working poor.

APPENDIX - GRAPHS

Figure 1 - The Competitive Labor Market Model

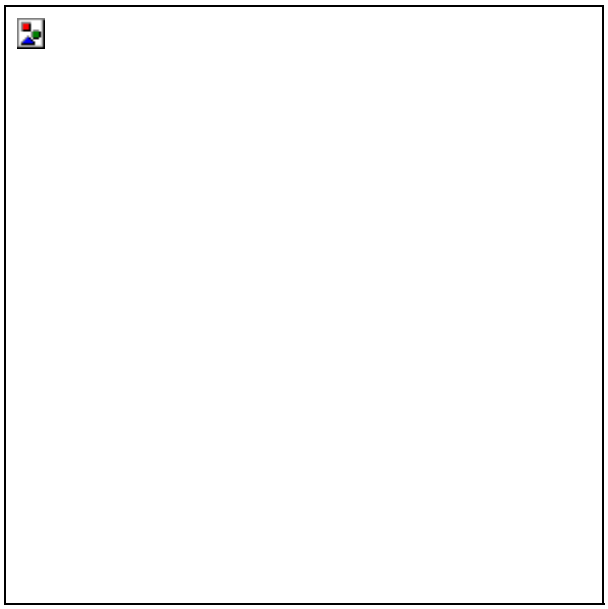


Figure 1 is adapted from Peterson's (1969) Figure II-1a.

With the market in equilibrium before the minimum wage is implemented, we have a wage rate of w0 and full employment at L0. After a minimum wage is imposed at **wmin** , additional workers are attracted to the market by the higher wage, and a labor force of **LS** is supplied to the market. However, at this higher wage, fewer laborers can be hired such that their marginal revenue product exceeds their wage. Therefore, only **LD** labor is hired. Thus, there is an excess labor supply of (**LS - LD**). In this way, the implementation of the minimum wage causes employment to decrease from L0 to **LD** , and the unemployment rate to rise from 0 to (**LS - LD**)/ **LS** .

Figure 2a - The Shock Model - Unemployment, Reduced Employment

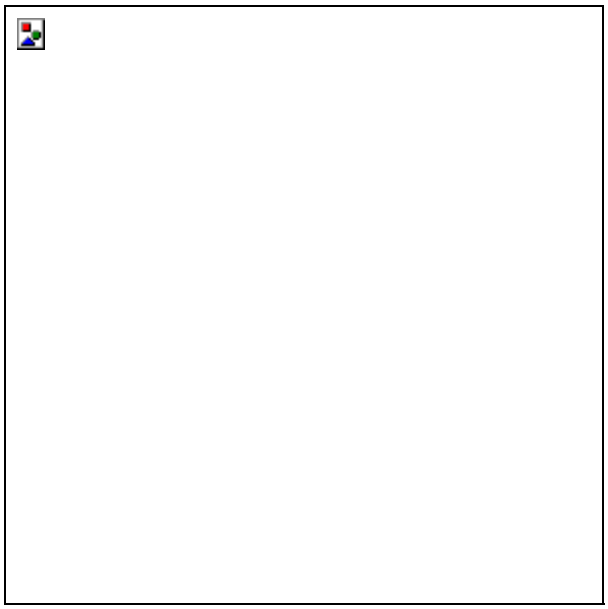


Figure 2a is adapted from Peterson's (1969) Figure II-1b.

With the market in equilibrium before the minimum wage is implemented, we have a wage rate of w0 and full employment at L0. After a minimum wage of **wmin** is implemented, firms are induced to improve efficiency in their operations, making labor more productive (and thus relatively less expensive at every price) and shifting the labor demand curve from DL to **DL** . However, this increase is not large enough to offset the decrease in employment caused by the higher wage level. Thus, **LS** of labor is supplied to the market, while only **LD** is hired, creating an excess labor supply of (**LS - LD**). In this way, the implementation of the minimum wage causes employment to decrease from L0 to **LD** , and the unemployment rate to rise from 0 to (**LS - LD**)/ **LS** .

Figure 2b - The Shock Model - Unemployment with Stable Employment

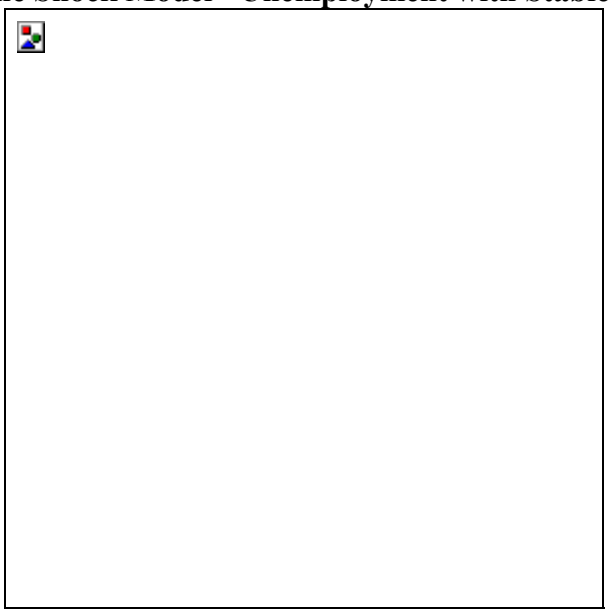


Figure 2b is adapted from Peterson's (1969) Figure II-1b.

With the market in equilibrium before the minimum wage is implemented, we have a wage rate of w0 and full employment at L0. After a minimum wage of **wmin** is implemented, firms are induced to improve efficiency in their operations, making labor more productive (and thus relatively less expensive at every price) and shifting the labor demand curve from DL to **DL** . In this case, this increase is just large enough to offset the decrease in employment caused by the higher wage level. However, because the wage has increased, the quantity of labor supplied to the market increases to **LS** . Thus, the market has an excess supply of labor of (**LS** - L0). In this way, the implementation of the minimum wage keeps employment constant at L0 while increasing the unemployment rate from 0 to (**LS** - L0)/ **LS** .

Figure 2c - The Shock Model - Unemployment, Increased Employment

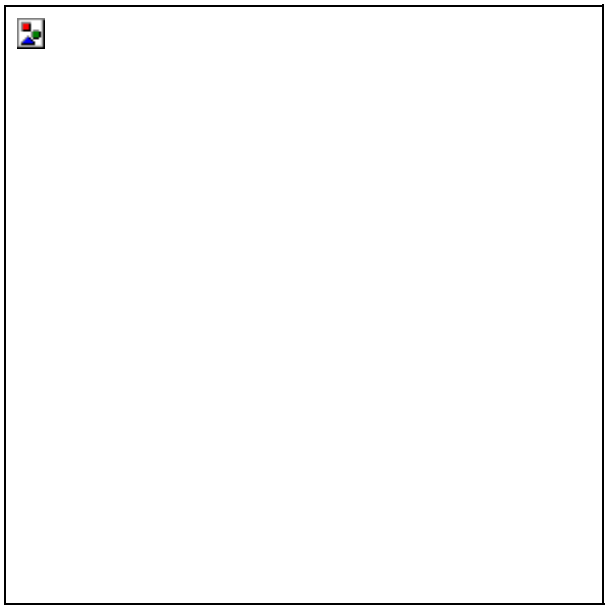


Figure 2c is adapted from Peterson's (1969) Figure II-1b.

With the market in equilibrium before the minimum wage is implemented, we have a wage rate of w0 and full employment at L0. After a minimum wage of **wmin** is implemented, firms are induced to improve efficiency in their operations, making labor more productive (and thus relatively less expensive at every price) and shifting the labor demand curve from DL to **DL** . In this case, the demand shift is large enough to more than completely offset the decrease in employment resulting from the increased minimum wage. However, the demand has not shifted far enough to completely satisfy the new labor supply, **LS** . Thus, an excess labor supply of (**LS - LD**) is created. In this way, the

implementation of the minimum wage causes employment to increase from L0 to **LD ,** and the unemployment rate to rise from 0 to (**LS - LD)/ LS** .

Figure 2d - The Shock Model - Increased Full Employment

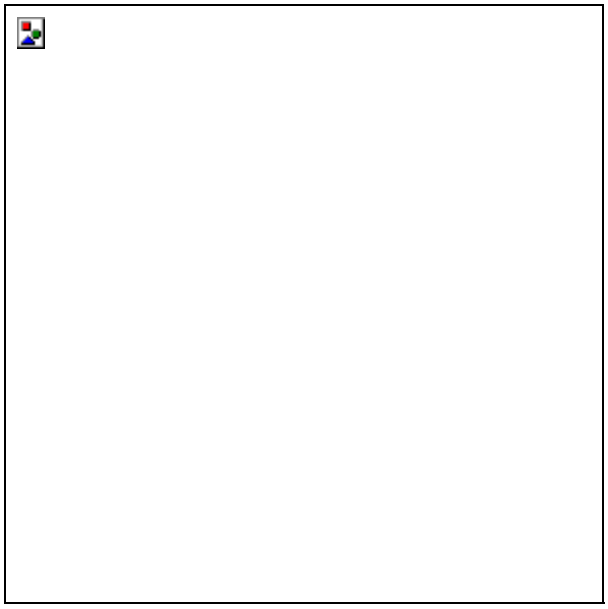


Figure 2d is adapted from Peterson's (1969) Figure II-1b.

With the market in equilibrium before the minimum wage is implemented, we have a wage rate of w0 and full employment at L0. After a minimum wage of **wmin** is implemented, firms are induced to improve efficiency in their operations, making labor more productive (and thus relatively less expensive at every price) and shifting the labor demand curve from DL to **DL** . In this case, the demand increase is more than enough to offset the disemployment effect of the minimum wage. Moreover, demand shifts just far enough to satisfy the new quantity of labor supplied of **L1** . Thus, the market has moved from its original full employment level, L0, to a higher full employment level of **L1** .

Figure 3 - The Monopsony Model

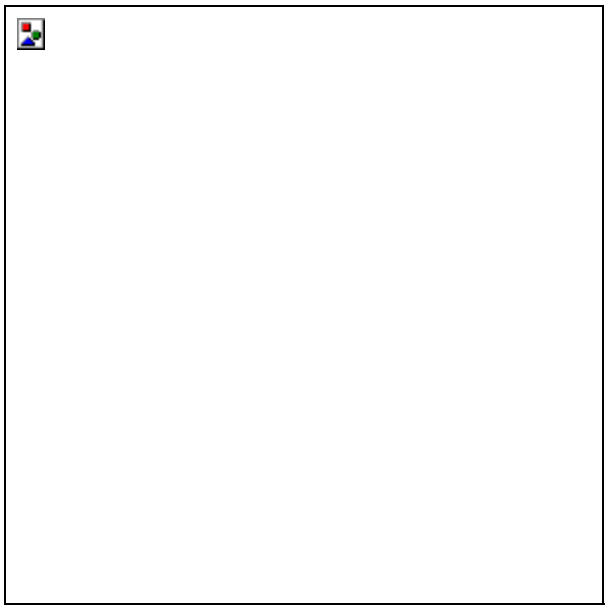


Figure 3 is adapted from Pindyck's (1995) Figure 10.14(b).

A monopsonist, as the sole buyer of labor, faces the upsloping labor supply curve, SL. this curve represents the wage, or average cost (ACL), the monopsonist must offer to attract a given labor force. The monopsonist also faces a marginal cost curve (MCL) steeper than its average cost curve. To maximize profits, the monopsonist purchases labor at the point where its marginal cost equals its marginal revenue product (MRPL), or demand for labor (DL). As a result, the monopsonist employs L0 workers at a wage of w0. However, these levels of wage and employment are each less than the market equilibrium of **L*** workers at a wage of **w*** . If a floor wage is implemented, the monopsonist's marginal cost and average cost curves effectively become horizontal at the new wage rate. In this way, a small range of minimum-wage increases will increase employment. The maximum attainable employment level of **L*** will be reached with a minimum wage of **w*** .

Figure 4 - The Vertical Demand Model

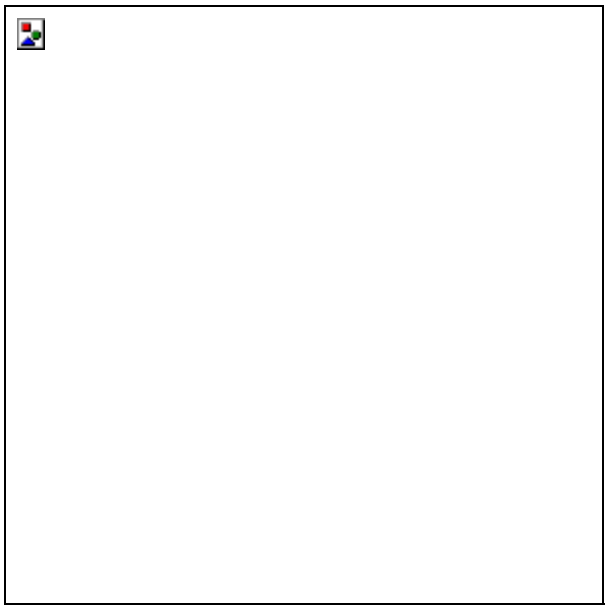


Figure 4 is adapted from Peterson's (1969) Figure II-2b.

In the case depicted above, the firm's cost structure creates a perfectly inelastic labor demand within a certain range of wages. However, outside this range, a typical downsloping demand is realized. If the equilibrium wage level in the market is originally at **w1** , firms will employ **L1** of labor. If the wage is originally at **w2** , firms employ **L2** of labor. In either case, because these points lie on downsloping portions of the demand curve, imposing a wage floor above the market wage will result in decreased unemployment. However, if the wage below **wu** and no lower than **wl** , imposing a minimum wage no higher than **wu** will hold labor constant at **L0** .

REFERENCES

Burkhauser, Richard V., Kenneth A. Couch, and David C. Wittenburg. (1996). "'Who Gets What' from Minimum Wage Hikes: A Re-Estimation of Card and Krueger's Distributional Analysis in *Myth and Measurement: The New Economics of the Minimum Wage*." *Industrial and Labor Relations Review* 49(4): 547-552.

Card, David, and Alan B. Krueger. (1995). *Myth and Measurement: The New Economics of the Minimum Wage* Princeton: Princeton UP.

Gordon, Kenneth. (1981). "The Impact of Minimum Wage on Private Household Workers." *The Economics of Legal Minimum Wages* Ed. Simon Rottenberg. Washington: American Enterprise Institute, 191-209.

Hart, Vivien. (1994). *Bound by our Constitution: Women, Workers, and the Minimum Wage* Princeton: Princeton UP.

McCulloch, J. Huston. (1981). "Macroeconomic Implications of the Minimum Wage." *The Economics of Legal Minimum Wages* Ed. Simon Rottenberg. Washington: American Enterprise Institute, 317-326.

"Of Magic, Myth and the Minimum Wage." (1995) *The Economist* 336: 94.

Peterson, John M. and Charles T. Stewart. (1969). *Employment Effects of Minimum Wage Rates* Washington: American Enterprise Institute.

Pindyck, Robert S. and Daniel L. Rubinfeld. (1995). *Microeconomics* 3rd ed. Englewood Cliffs, NJ: Prentice Hall.

Prasch, Robert E. (1996). "In Defense of the Minimum Wage." *Journal of Economic Issues* 30(6): 391-397.

Spriggs, William E. and Bruce W. Klein. (1994). *Raising the Floor: The Effects of the Minimum Wage on Low-Wage Workers* Washington: Economic Policy Institute.