Employment and welfare effects of a minimum wage order

Lorne Evert Sivertson

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EMPLOYMENT AND WELFARE EFFECTS OF A MINIMUM WAGE ORDER

By

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INTRODUCTION

A minimum wage law prohibits employers in industries covered by the law from paying workers a wage rate below some specified amount. In the United States, a national minimum wage rate was first established in 1938 with the enactment of the Fair Labor Standards Act (FLSA). It was, and still is, the major objective of this Act to eliminate as rapidly as practicable, "labor conditions detrimental to the maintenance of the minimum standard of living necessary for health, efficiency, and general well-being of workers ... without substantially curtailing employment or earning power." In other words, the purpose of FLSA is to eliminate low wages without eliminating jobs.¹

Workers in the laundry, cleaning and dyeing industry are among the lowest paid in this country. In mid 1966 a Department of Labor survey revealed that the average wage in this industry was $1.43 an hour although one-eighth of these workers earned less than $1.00 an hour. Regionally, plant

workers averaged $1.14 an hour in the South, $1.51 in the North Central, $1.61 in the Northeast, and $1.73 in the West. In these regions employees earning less than $1.00 an hour constituted 34.4 percent, 3.96 percent, .2 percent, and 1.5 percent of the industry work-force respectively.²

Prior to 1966, only about one-sixth of all workers in the laundry, cleaning and dyeing industry were covered under the provisions of the Fair Labor Standards Act.³ But effective February 1st, 1967, virtually all laundry, cleaning and dyeing establishments in the United States were required by the Act to pay their employees a minimum wage of $1.00 an hour.⁴ While this wage order had some effect on the industry

²For workers earning less than $1.15 an hour the figures were: 59.1 percent in the South, 16.5 percent in the North Central, 4.3 percent in the Northeast, and 7.5 percent in the West. "Industry Wage Survey—Laundry and Cleaning Services Mid 1966," U.S. Department of Labor, Bureau of Labor Statistics, Bulletin No. 1544 (Mid 1966), pp. 3-4.

³Almost all of those workers covered by FLSA prior to 1966 worked in industrial laundries and linen supply plants who sold to other firms engaged in inter-state commerce. Thus the two largest branches of the industry, power laundries (166,417 workers) and cleaning and dyeing plants (221,683 workers), were not covered to any significant degree by the Federal Law. "Data Pertinent to an Evaluation of the Need For and the Feasibility of Extending the Minimum Wage," U.S. Department of Labor, Wage and Hour and Public Contracts Division, (January, 1962), pp. 6-10.

⁴"All other employees [those not previously covered] employed in laundry enterprises, regardless of their previous status under the Act, and without regard to the annual volume of sales or business done, are newly covered employees, and unless specifically exempt, must be paid not less than the minimum wages for all hours worked." "Laundries and Dry Cleaning Establishments Under the Fair Labor Standards Act as
in all regions of the country, it is clear that the main impact was in the South where one-third of the workers were earning less than the minimum.\(^5\)

One who is concerned not with the rhetoric but with the results of legislation may well ask: "Did the 1967 minimum wage order in the laundry, cleaning and dyeing industry have those salutary effects which are intended by the Fair Labor Standards Act?" That is, did extending the coverage of FLSA to this industry help to abolish poverty; did this action help to reduce the number of people with low incomes?

It is the primary purpose of this paper to provide an answer to this question. While the emphasis here will be on the presentation and analysis of inductive evidence relevant to minimum wage effects in the laundry, cleaning and dyeing industry, a deductive analysis of the problem must precede the empirical inquiry. For theory plays two very important roles in any useful empirical investigation:

---


First, theory narrows the range of plausible outcomes and indicates what data to collect in order that we may discover what has happened. Without a theoretical framework the investigator commits the error of meaninglessly "counting manhole covers." And second, theory provides a guide for the interpretation and the extrapolation of inductive evidence so that we can arrive at the desired result, i.e., an answer to the question in hand.

The first few chapters of this paper, therefore, will be taken up with a theoretical discussion of the welfare effects of minimum wage laws in low-wage industries. After having adumbrated the theoretical possibilities of imposed wage increases on the welfare of workers, the empirically testable hypotheses which are drawn from these wage theories are next stated in rigorous fashion. The next two chapters in turn describe the inductive procedure employed and report the findings of the statistical test of these hypotheses. The final chapter of this paper is then devoted to weighing this evidence so that some conclusion may be reached as to the effects of the 1967 FISA minimum wage order on the welfare of low-wage laundry, cleaning and dyeing workers.

6 This expression has been attributed to James M. Buchanan.
CHAPTER I

THE COMPETITIVE MODEL OF THE FIRM

Raising the wages of low-wage workers above the market wage rate by means of legal wage minima cannot, we are told by economists of the classical tradition, help to reduce poverty or to ameliorate distributive inequities. For, in the process of eliminating low wages, the minimum wage must also eliminate a considerable number of jobs. As J.R. Hicks has succinctly put it: "A raising of wages above the competitive level will contract the demand for labour, and make it impossible to absorb some of the men available."¹ Hence, the Neoclassicists argue, the effects of the minimum wage law are precisely opposite to those intended: "insofar as minimum wage laws have any effect at all, their effect is clearly to increase poverty."²

This conclusion has as its theoretical foundation the competitive model of the firm. The competitive model consists of three elements: the marginal productivity theory of wages,


the assumption of competition both in the labor and product markets, and the method of static partial-equilibrium analysis. Before becoming further involved in a discussion of the minimum wage implications of this model, the model itself should first be examined briefly.

The Level of Employment in a Competitive Firm

Basic to marginal productivity theory is the proposition that a firm will hire a resource as long as it adds more to total revenue than to total cost. If this principle is followed, equilibrium will be achieved when the marginal cost of each factor to the firm is equal to its marginal revenue product. Here marginal profits are zero and so total profits are maximized.

Short-Run Equilibrium

In the short-run, the firm may vary the quantity of labor but not the quantity of capital that it employs. Hence

As will be seen later, it is not essential that the product market be perfectly competitive for there to be a negative wage-employment relationship. The same conclusion about the minimum wage can follow, although with less force, if the firm is a monopolistic competitor, a monopolist, and in some instances an oligopolist. The difference lies in a less elastic demand curve for labor in these non-competitive cases (assuming that the only difference between competitive and non-competitive firms is the control of product prices by the latter).

For a more complete treatment of the competitive wage model see: Hicks, The Theory of Wages, Chapters I through II; Paul H. Douglas, The Theory of Wages (New York: Macmillan
to maximize profits, the firm will hire additional workers until the marginal revenue product of labor, which declines continuously as employment expands, equals the marginal cost of labor. Because price and marginal revenue are identical in competition, the competitive firm will hire workers only as long as the value of the marginal product exceeds the marginal cost of labor.

If workers are mobile and compete for jobs, the supply of labor to the individual competitive firm will be infinitely elastic at the prevailing rate; it can obtain all the labor it desires at this wage; but can obtain none at a slightly lower rate. Therefore the marginal cost of labor will coincide with the wage for workers, and the competitive firm's short-run equilibrium level of employment will be at that point where the value of the marginal product of labor is equal to the market wage rate.6

5Declining marginal productivity follows from the Law of Diminishing Returns. Competitive wage theory assumes that labor is infinitely divisible so that the marginal productivity curve declines in a smooth and continuous fashion. There is no range of indeterminateness or absolute inelasticity. See Hicks, The Theory of Wages, pp. 24-27.

6Following C. E. Ferguson: Let the production function be \( q = f(x) \), where \( x \) is the single variable productive service—labor. Labor's marginal product is then \( f'(x) \). Since the entrepreneur operates in perfectly competitive commodity and factor markets the market price of the commodity (\( p \)) and the
Figure I-1 may help to illustrate this wage model:

In this figure the schedule of labor's marginal value product is labelled VMP. The market wage is OW so the supply of labor to the firm is horizontal at WB. First, suppose that the firm employed ON' units of labor. With this number of workers the value of the marginal product is N'B' = OW', which is greater than the wage rate. An additional worker would add more to total revenue than to total cost. Therefore a profit maximizing entrepreneur would hire more workers.

Now suppose that ON'' units of labor are employed by the firm. Here the value of labor's marginal product N''B'' = 

wage rate (w) are given. The profit function is \( \pi = pq - wx - F = \text{pf}'(x) - wx - F \), where F represents fixed cost and wx is the variable cost. The entrepreneur adjusts his input so as to maximize profit. Thus \( \frac{\pi'}{dx} = \text{pf}'(x) - w = 0 \), or, \( \text{pf}'(x) = w \), the theorem stated above. *Microeconomic Theory* (Homewood, Illinois: Richard D. Irwin, Inc., 1969), pp. 364-65.
OW", which is less than the wage rate. Thus the last worker adds more to total cost than to total revenue. A profit maximizing entrepreneur will therefore reduce employment. Clearly with the wage rate at OW the entrepreneur will hire ON units of labor, no more and no less, for, here, the last worker contributes as much to revenue as he adds to cost.\footnote{This is the conventional proof of the marginal productivity proposition. It is found in Hicks, The Theory of Wages, pp. 8-9, and in Ferguson, Microeconomic Theory, pp. 363-65.}

In figure I-1, labor's marginal value product schedule is drawn for a particular and given product price, stock of capital, and level of technology. If labor becomes more efficient because of improvements or increases in capital, or the market price of its product rises, the VMP curve—which in this model is the demand curve for labor—will shift upwards and there will be a new and higher equilibrium level of employment. Conversely, if labor's efficiency should deteriorate because of a decrease in the quantity of capital, or the product price should fall, the demand curve for labor will shift down and fewer workers will be employed at wage rate OW. What is important here is that for a given stock of capital and technology, and for a given wage rate and product price, there is a uniquely determined level of employment in the competitive model. A change in any one of
these variables causes adjustments to be made in employment and a movement to a new equilibrium.8

Long-Run Equilibrium

In the long-run, capital becomes a variable factor of production. Given the freedom to vary all inputs, the profit maximizing competitor will seek that combination of factors which will give equality between marginal products and factor prices. Thus, labor and capital will be added until the value of the marginal product of these factors is equal to the wage rate and interest rate respectively.9


9 Wicksteed long ago pointed out that if the production function is homogeneous of degree one in labor and capital—if labor and capital are increased in the same proportion, production will increase in that ratio—then payment in accordance with marginal productivity will exhaust the total product. That is,

\[ P = L \frac{\partial P}{\partial L} + k \frac{\partial P}{\partial k} \]

where \( P \) is the total product, \( L \) is labor, \( k \) is capital, and \( \frac{\partial P}{\partial L} \) and \( \frac{\partial P}{\partial k} \) are the marginal products of labor and capital respectively. The proof of this rests on Euler's theorem on homogeneous functions and can be found in Henry Schultz "Marginal Productivity and the Pricing Process," JPE, Vol. 37 (1927); pp. 505-51.
If the price of one factor, say labor, should rise, it is inevitable that the entrepreneur will suffer a reduction in profits. However, he will do all that he can to make this reduction as small as possible. First, he will reduce his demand for workers since the value of the marginal product of labor is now less than the wage rate. Output then falls. But, with a lower level of output, less capital will be required. However, because the price of capital has not changed, a proportional reduction in the quantity employed will cause the value of its marginal product to exceed its price. There will thus be a tendency for the entrepreneur to substitute relatively cheap capital for labor in his production process until the equality between marginal productivities and prices is restored.

---

10 The change in the capital-labor ratio and the change in the relative income shares of capital and labor will depend upon the elasticity of substitution. If it is difficult to substitute capital for labor—if the elasticity of substitution is low—there will be little change in the capital-labor ratio and labor's relative income share will increase. Conversely, if capital can be readily substituted for labor—if the elasticity of substitution is high—there will be a marked change in the capital-labor ratio (much more of the output will be produced by capital) and labor's relative income share will fall.

Therefore, the demand for labor will contract following a wage increase both because a smaller level of output will be produced, and because a given level of output will be obtained with fewer workers.
CHAPTER II

THE COMPETITIVE MODEL OF THE FIRM
AND MINIMUM WAGE LAWS

There is nothing about the effects of a legal minimum wage on a competitive firm that has not yet been dealt with, at least implicitly, in the previous chapter. If the minimum wage is at all effective, if it does not lie below the wage actually paid by the firm, the firm will reduce employment, and reduce it more the larger the wage increase, ceteris paribus.¹ In the short-run, this outcome results mainly from the contraction of output due to the increase in wage costs. The decline in employment is intensified by any substitution of capital for labor that technology and time permit. While such substitution can mitigate the rise in the cost of production, it cannot completely eliminate it--otherwise the labor would not have been used even before the wage was increased--and so there remains a

¹It must be remembered that in competition an increase in the price of a factor will always result in a reduction in the demand for that factor, ceteris paribus. That is, the slope of the demand curve for a productive service with respect to its own price is always negative (∂k/∂P_k < 0, and, ∂L/∂P_L < 0). See Jacob L. Mosak, "Interrelations of Production, Price and Demand," JPE, Vol. 46 (1938), pp. 761-87.
net increase in average cost. If this increase is too great, the firm may cease production.

Ceteris paribus conditions are rarely realized, however, even for very short periods of time. Firms usually do not operate in a stationary economy. Market prices, the capital stock, and technology are constantly changing so that the demand curve for labor is moving either up or down. And if a firm's labor demand is shifting upwards, it may not actually reduce employment as the result of an effective minimum wage; it may just reduce the rate of growth in demand for labor. Conversely, a firm that has been on the downgrade and has been reducing employment, will, as the result of a minimum wage law, hasten its disemployment of labor. In either case, competitive theory affirms that the minimum wage will have negative effects on employment, but because of exogenous influences the effects may be hidden and impossible to identify when looking at employment in a single firm or at total industry employment.

Thus, if a firm has been expanding its demand for labor by one percent a year in the past (labor's marginal productivity schedule has been shifting up), and its labor demand schedule is of unit elasticity, a one percent rise in wages required by a minimum will not cause any direct lay-offs, but will reduce the rate of growth in employment to zero in that year.

As we shall see in a later chapter, a cross-section study of an industry whose firms have been unequally affected by a minimum wage is one way of overcoming this problem.
Welfare Effects

Competitive wage theory suggests that the unemployment created by the minimum wage law may be either relative or absolute. If legal wage control is limited to particular employments, unemployment will be only temporary. Unemployed workers will shift from regulated to unregulated trades where they will earn and produce less than they did before. The main effect resulting from this uneconomic redistribution of labor is underemployment. However, if all low-wage occupations are covered by the minimum wage law the unemployment must be absolute, and in a sense permanent. Workers who are displaced by the minimum wage will have no "second-best" alternatives—since they must be sub-marginal in all employments—and they will be condemned to earn and produce nothing. Their unemployment must go on until the long-run economic forces which determine competitive wage-levels—technological innovation, the growth in capital stock, etc.—raise wages enough to absorb these men. As Hicks wrote: "When the control of wages is general ... the unemployment must go on until the artificial wages are relaxed, or until competitive wages have risen to the artificial level."

"Hicks, The Theory of Wages, p. 181.
Sidney Webb, "The Economic Theory of a Legal Minimum Wage," JPE, Vol. 20 (December, 1912), pp. 978-84; F.H. Blum, "Marginalism and Economic Policy: A Comment," AER, Vol. 37 (September, 1947), pp. 645-52; Rothschild, The Theory of Wages, Chapter 13; and others, have argued that the preoccupation of the marginal productivity school with static equilibrium and with small changes at the margin has led them to neglect
Summary

In summary, competitive theory asserts that the Fair Labor Standards Act cannot help to reduce poverty as it is intended to do, but must instead perpetuate and exacerbate distributive inequities. The minimum wage raises some workers' wages by a small amount, but in doing so produces unemployment and intensifies poverty. According to this view the minimum wage is perverse because more, not fewer, people are poor as a result of it.

The long-run effects on economic development of minimum wages. While these writers generally concede that some unemployment will result initially from the forcing up of wages, they argue that the resultant "rationalization" of industry will produce higher average wages over the long-run.

This is one of the most complex and controversial questions of economic theory and beyond the scope of the present study. Our interest lies rather with the most perceivable short-run effects of wage legislation.
CHAPTER III

ALTERNATE MODELS OF THE FIRM AND MINIMUM WAGE LAWS

The Neoclassicists' prediction of dire consequences arising from wage regulation is just one view and not an immutable law of economics. Another view, generally supported by students of labor relations, rejects the competitive analysis because the assumptions of this model, it is alleged, are spurious. These economists have proposed alternate, non-competitive models of the firm—the monopsony model, the high-wage model, the shock model, the oligopoly model, and the model with fixed factor coefficients—which, it is claimed, make assumptions more realistic than those of competitive theory. While the kinks, discontinuities, and dynamic elements of these models make them quite different from each other in many ways, they are all similar in that they predict minimum wage effects directly opposed to those given by the competitive model. As one labor economist has written:

The [competitive] theory is based upon a number of assumptions that frequently fail to fit the facts of modern economic life. 1

... for a number of reasons, this model lacks good predictive value within a limited zone or range of wage change. Within such a range, the

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effects of a wage change imposed by a legal minimum wage can take any one of a variety of paths. Along some of these paths there may be no employment consequences or even some employment increases, provided that the wage rise is moderate and within the range. 2

If this second view is correct—if raising the wages of low-wage workers above the market rate does not result in a number of them being discharged from work—the Fair Labor Standards Act must realize its goal. In such a case it unambiguously helps low-wage workers by reducing their degree of poverty. Let us now see how this result may come about.

Monopsonistic Conditions

When labor markets are competitive there is a tendency for wages to seek a common level for a particular class of worker in all firms.3 However, empirical studies have shown that there are often marked differences in wage rates for similar types of jobs in the same locality.4 On the basis of evidence such as this, some economists have concluded: "It is obvious that little competition prevails in many local markets. Nor is there sufficient mobility of labor to permit


3It must be noted here that wage differentials are not inconsistent with competitive wage theory. The theory only claims that wages of all workers will be equal in full equilibrium, i.e., J. B. Clark's stationary state. See Cartter, Theory of Wages and Employment, pp. 13-21.

4"The New York State Department of Labor, for example, found that the wages of women laundry workers in 32 New York
competition among firms in different localities." The firm then "is very often in the position of a single buyer of labour, is a monopsonist." And therefore, "minimum wage regulation is needed primarily because labor markets are so imperfect, and because exploitation of labor can and does occur." By "removing the monopsonistic framework [a legal minimum wage] may be able to raise wages and employment." A monopsonist because of his size or labor immobility faces an upward sloping labor supply curve. When he seeks to attract additional workers, the monopsonist must pay higher wages, not only to the new worker, but to those already employed. This means that the extra cost of an additional worker to the monopsonist is not only the wage he must pay the worker, but also the increment of wage that must be paid to the old municipalities showed a complete lack of standardization in May 1933... The hourly rate for flat workers ranged from 13 to 50 cents; the full-time weekly earnings of press operators varied from $6 to $20; and the actual weekly earnings of hand ironers ranged from under $3 to $28. Average weekly earnings were $3.67 in one plant and $5.12 in another. Lester; Economics of Labor, pp. 314-15.


6Rothschild, The Theory of Wages, p. 94.

7Lester, Economics of Labor, p. 316.

8Rothschild, The Theory of Wages, p. 98.
employees. Therefore when the monopsonist follows the profit maximizing criterion (identical with that of the competitive employer) of hiring laborers until the value of the marginal product of the last worker is equal to the marginal cost of the worker, he will hire fewer workers and pay them a lower wage than would a competitive employer. Moreover, this wage exploits the workers because it is less than what any of them contributes to total revenue—a monopsony profit is earned.\(^9\)

Diagrammatically, the monopsony case appears as follows:

![Diagram of Wage and Units of Labor](image)

To maximize profits, the monopsonist hires workers up to the

\(^9\)In the case of monopsony there can be profits (an excess of value over cost) even if the firm is a competitive seller.
point at which the marginal cost of labor is equal to the value of the marginal product, and so hires ON units of labor. The value of the product added by the last worker is OW', but he, and his fellow workers, receive only the wage OW (the transfer price of the marginal worker). There is monopsonistic exploitation in the amount of OW' - OW.

Here is fertile ground for minimum wage regulation. Suppose that the government establishes a minimum wage of OW''. Because the firm cannot pay less than this rate, the supply curve of labor becomes W''ASL, while the marginal cost curve drawn to this supply curve is discontinuous and is given by W''ABMN. The monopsony advantage disappears, and the wage-employment solution will be the same as would obtain if the labor market was competitive. The monopsonist maximizes profits, equating the value of the marginal product with the marginal cost of labor, now the minimum wage rate, and hires ON'' units of labor. As a result of the minimum, wages are now higher, employment has expanded, and labor now receives the value of its marginal product.  

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10 If the minimum wage should be set at OW', exploitation would still be eliminated and workers would receive higher wages, but, employment would not expand. At any wage above OW', employment would fall. However, since minimum wage laws usually require very modest wage increases, monopsony control would have to be very slight for unemployment to result. For further discussion on the monopsony case see: R. A. Bila, Microeconomic Theory: A Graphical Analysis (New York: McGraw-Hill, 1967), pp. 268-69; Ferguson, Microeconomic Theory, pp. 410-13; Rothschild, The Theory
From the analysis of monopsony, it is clear that exploited workers can be helped by a legal minimum wage. However, one must ask: "Are monopsony conditions prevalent among the low-wage industries that are affected by minimum wage laws?" J. R. Hicks believed otherwise, he wrote:

Exploitation is just as probable, if not more probable, in better-paid as in worse-paid trades. It is, in fact, extremely improbable that exploitation has much to do with the grosser scandals of the labour market. The extreme cases of poverty and low earnings have usually arisen, not in regular trades, where the peril of exploitation is admittedly present, but in those trades which we have classified as casual, in the widest sense. But in casual trades, competition is generally quite sufficiently intense to prevent any possibility of exploitation. Casual labour is often badly paid, not because it gets less than it is worth, but because it is worth so appallingly little. 11

Further, an imperfect labor market does not ipso facto insure that monopsonistic exploitation will occur. Exploitation occurs when an individual firm can affect the price of labor, i.e., the firm's labor supply curve is upward sloping.

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11Hicks, The Theory of Wages, p. 82.

On monopsony Milton Friedman writes: "It is perhaps worth noting explicitly that this case [monopsony] is little more than a theoretical curiosum, and cannot be regarded as of any great practical importance. This is partly because significant degrees of monopsony are particularly unlikely to occur for factors of the kind affected by minimum wage rates; partly because even in such cases there is no presumption the minimum wage rate will fall in the interval analogous to $\text{ow}$ to $\text{OW}$," Price Theory, p. 190.
But this implicitly assumes that full employment prevails in the local labor market, and, according to John Moes:

Under the conditions typically prevailing in labor markets where the minimum wage is likely to be effective, this assumption of full employment is as unrealistic as that of pure competition. Such labor markets are usually characterized by widespread disguised or open unemployment (this abundance of labor being the primary cause of the low-wage level). Thus at actual prevailing wage rates in the various enterprises the supply of labor is perfectly elastic. There simply is no relation between the wage rate and the quantity of labor demanded by either the individual entrepreneur or all entrepreneurs together, and in the absence of such a relation there is no room for the exercise of monopsony power. The introduction of a minimum wage when there is unemployment merely means that employers come to be faced with a horizontal supply curve of labor at a higher level; employment will tend to be reduced, and the unemployment problem is aggravated. 12

Inelastic Demand for Labor

"Any discussion of the impact of wage changes on employment," write Lloyd G. Reynolds and Peter Gregory, "implicitly involves an estimate of the elasticity of demand for labor." 13 The competitive model, it has been seen, assumes that the elasticity of demand for labor is greater than zero. Thus, other things being equal, an independent wage increase


must result in a decrease in employment in a competitive firm. Now, if instead it is assumed that the elasticity of demand for labor is just zero, it follows that a minimum wage increase will, ceteris paribus, not result in a reduction of employment. A demand curve with this configuration could occur in an oligopolistic situation where the firm's product demand curve is kinked and discontinuous for some range, or, in a situation where the proportions of labor and capital are technically fixed to the firm in the short-run.

Oligopoly and the Kinked Demand Curve

In classical economics, product markets are organized along the lines of either pure competition or pure monopoly. The difference in these two market structures is found in the firm's product demand elasticities, i.e., the degree to which the firm controls the price it charges. In competition the firm has no control over price, so its demand curve is infinitely elastic. But, in monopoly the firm can affect price by its output decisions, so its product demand curve is less than perfectly elastic.

The elasticity of demand for labor is "a weighted average of the elasticity of substitution of capital for labor and the elasticity of \[\text{product}\] demand." Because price remains

constant as the competitive firm expands production, its elasticity of demand for labor is just a function of the elasticity of substitution. Because the price of output declines as the monopolist expands production, his demand for labor (assuming the elasticity of substitution to be the same) must be less elastic than in the competitive firm. Thus, all other things being equal, a given change in wages will result in a greater change in employment in the competitive firm than in the monopoly. But in both cases, a minimum wage increase will result in some unemployment.

In recent times, some economists have discarded the models of pure competition and pure monopoly, charging that these models are unnecessarily restrictive and unrealistic. There are rarely, they contend, many firms competing to sell a homogeneous product or one firm selling a product that has no close substitutes. Rather: "The commonest market situation is one of oligopoly with product differentiation, in which case the demand curve must be regarded as kinked (and the marginal revenue curve as discontinuous) at the existing

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15"Competition is always in course of bringing itself to an end. At any moment in prosperous modern industries, the number of firms is tending to fall and competition is becoming more oligopolistic." Robinson, The Economics of Imperfect Competition, p. ix.
That is, in most situations there will be a small number of firms competing and a "customary" price prevailing in the market from which any individual firm will be afraid to move. To raise his price if others did not also increase their prices would mean a drastic reduction in his revenue, as would a price cut if others introduced similar price cuts.

Since the elasticity of demand for labor is a function of the elasticity of substitution, and, in imperfect competition, the elasticity of the revenue schedule marginal to demand, the oligopolist's demand curve for labor will be totally inelastic over some range (because of the discontinuity in marginal revenue). Thus the oligopolist will hire that number of workers, irregardless of the wage rate it must pay, which is required to produce the level of output which will not disturb the customary price. To quote Reynolds again:

In this case one cannot really say that output and employment are determined by the intersection of the (horizontal) marginal cost curve and the (discontinuous) marginal revenue curve. The causal sequence starts rather with the determination of a price for the product. This decision is probably heavily influenced by consideration of the firm's long-range market strategy vis-à-vis competing firms, and takes into account cost changes common to the industry as a whole, but is very little influenced by cost changes peculiar to the firm in question. Once the price has been set, output is determined solely by the

firm's estimate of how much can be sold at this price. Cost considerations are not directly involved in the output decision. 17

For many reasons, competing firms in the same industry may pay different wage rates. If this should be the case, a minimum wage order will have a differential impact: low-wage firms will have great cost increases while high-wage firms may be unaffected. Cost increases will tend to be particular to firms and not common to the industry. And if labor demand curves are in fact kinked, the minimum wage will not result in a reduction in output or a change in the product price. Low and high-wage firms alike will maintain the same level of production, although profits will be reduced in the former. Hence the minimum wage in oligopoly can raise the wages of the low paid workers without causing unemployment—at least in the short-run. 18

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18 Of course, when output remains constant and costs rise but prices do not, profits must fall. And if profits fall enough, in the long-run a firm may make some sort of adjustment which will not be favorable to labor. This, Reynolds does not deny: "It follows [from the oligopoly model] that there is no reason why a wage increase (or any other cost increase) confined to the firm in question should have any effect on output, unless a level of costs is reached which forces the firm to suspend operations entirely ... This is not to say, of course, that a wage increase will have no effects at all. If the firm's net revenue is reduced, there are likely to be effects on its investment expenditures, dividend payments, cash balances, and so on. All that is claimed here is that there is no direct effect on output such as one would infer from the existing theory of the firm." Ibid, pp. 297-98.
A small diagram may help to illustrate this argument:

S and N are rival firms operating in an oligopolistic industry. They produce good Y and charge the "administered" price X. Firm S has an advantage for it is in a low-wage labor market. Firm N must pay higher wages to obtain its requisite workforce. Now, suppose that a national minimum wage of $W'$ is established. Because the minimum has a differential impact, S will not expect N to follow the price increase it would need to cover the increased production costs. There is, therefore, no change in price and the kink remains at the same level. Because the labor supply schedule continues to cut through the gap in the labor demand schedules, the optimal level of employment and output in the industry and in each firm does not change. The main effect of the minimum
wage is to alter the relative size of the shares going to
profits and wages.19

The proposition that a minimum wage will not cause
unemployment in an oligopolistic industry depends upon the
assumption that rival firms pay dissimilar wage rates. If,
however, the oligopolistic firms deal in one labor market
and pay equal wages, the argument does not hold. This has
been pointed out by Fritz Machlup:

If the competitors of the firm must pay the same or
similar wage increases, the situation is altogether
different: the oligopolistic sales curve will shift
because each producer is apt to expect his competitors
to follow suit when he raises his selling price in
line with the increased production cost; hence, the
'break' of the 'imagined demand curve' will occur at
a higher price; but at this increased price the
physical sales volume will be smaller, and employment
will have to be reduced. Propositions about oligopoly
situations making selling prices inflexible and
employment in the firm insensitive to increased cost
must not be generalized: they are not likely to hold
when the costs of competing producers are also in-
creased. 20

Hence, employment will fall in an oligopolistic firm
when wages rise if the percentage rate of change is the
same for its rivals, but this may take more time than in a
competitive or monopolistic firm. And in the end, without

19 For further discussion of employment determination
under oligopoly see: Rothschild, The Theory of Wages, pp. 91
-92; and, Cartter, Theory of Wages and Employment, p. 57.

20 Fritz Machlup, "Rejoinder to an Antimarginalist,"
a knowledge of the production function, it will be impossible to distinguish empirically between the minimum wage adjustments of a competitive firm, an oligopolist, and a monopolist—they will all be consistent with what one would expect from the competitive model. 21

The inquiry into the validity of the oligopolistic model for minimum wage analysis should not rest here. For, one must still ask: "Are oligopolistic industries commonly subject to wage regulation?" Apparently Lloyd Reynolds thought so when he wrote oligopoly is "the commonest market situation." To Fritz Machlup, the oligopolistic model is certainly not a general theory of employment in the firm, but "a special case." 22

Technically Fixed Labor Requirements

Production occurs under conditions of variable factor proportions in the competitive model of the firm, i.e., the capital-labor ratio is flexible. Thus when successive doses of labor are added to a fixed stock of capital, output increases although the marginal physical product declines continuously. If a minimum wage is imposed the firm simply moves

21 That is, given a competitive labor market there will be a negative wage-employment relationship which is the competitive hypothesis.

up its negatively sloped labor demand curve, laying-off a number of unprofitable workers and then operates at a reduced level of output. At this lower level of output the firm continues to maximize short-run profits.

Production, however, may theoretically occur under conditions of fixed factor proportions so that the capital-labor ratio is completely inflexible in the short-run. In this case as labor is added to capital, the marginal product rises very rapidly to the optimum level of output, then falls abruptly to zero when it is passed. Thus labor requirements are technically fixed and the plant can operate efficiently with no more or no fewer workers.

Marginal employment adjustments to wage changes would be all but precluded, therefore, to a firm operating with this inflexible production function. Wages could vary over wide ranges, between zero at the lower limit and the average product at the upper limit (this is the shut-down point since any higher wage more than exhausts the total product), without employment changes being made by the firm.

This situation is shown below in diagrammatic terms:

![Diagram](image)

Figure III-3

The firm represented here has a production function with technically fixed labor requirements. The relevant portion of the marginal value product schedule (the labor demand schedule) is vertical. At the low wage OW the firm employs ON workers. If the government imposes a legal minimum wage in the amount of OW', technical considerations will dictate that the firm continue to employ ON workers. If it does retain these workers, the main effect of the minimum wage will be to alter the income shares going to capital and labor.\(^{24}\)

\(^{24}\)This inelastic nature of competitive short-run demand conditions is, perhaps, to some extent responsible for the very stiff attitudes of employers and trade unions in
There have been empirical studies of actual marginal cost curves which seem to suggest that many firms operate with plants that are more accurately described by the model with fixed factor coefficients than by the competitive variable proportions model. For example, Richard A. Lester found when he questioned fifty managers of Southern business firms that most believed they had decreasing marginal variable costs up to 100 percent capacity and that they maximized profits at 100 percent capacity. These same managers indicated that it would not be possible to reduce operating costs by lowering output.25

wage negotiations. For, in this period, a rise in wages cannot be followed by a considerable reduction in the number of employed if the equipment is to be used at all; because to rearrange plant and production processes is a slow business. This will mean that the rise in wages will lead to a rise in the wages bill which, if the rise in wage rates is considerable, may well eat into profits, interest, depreciation charges, and other overhead costs. And in the short period, while capital cannot be transformed, there will be no escape from such a situation. The inelastic nature of short-term demand will also induce the trade unions to resist strongly any pressure towards lowering wages. For this would mainly mean that less is paid to all the workers while the increase in employment due to the fall of wages would, during this period, be very small. If we remember that under modern conditions, with capital equipment having a life extending over many years, the 'short period' may be very long indeed, it will be clear that such wage negotiations will be hotly contested; for, during that period at least, they will have an important influence on how the industry's product is shared between capital and labour." Rothschild, The Theory of Wages, p. 23.

From this evidence Professor Lester and others\^26 have concluded that a minimum wage will generally have no effect on a firm's level of employment. Lester writes:

Most manufacturing concerns apparently are considered by their executives to be operating at decreasing unit variable costs all along the scale between 70 and 100 percent of plant capacity. Consequently, it is seldom practical for a firm to curtail output (and, therefore, employment) simply in response to an increase in wage rates. \^27

On this subject, "marginalists," such as Professor Machlup, are wont to point out that market imperatives will take precedence over technical considerations in the end. Machlup writes:

To be sure, manufacturing firms may not 'curtail output' in direct response to wage increases; they are more likely to raise selling prices, which in a given market situation will reduce sales--so that it would be the sales volume rather than the wage level that appears as the 'direct' cause of any output reductions. \^28

Alternately, if a firm is engaged in very active competition, it cannot independently raise its selling price and so will have a great incentive to either find a new plant which cuts the losses it is sustaining on a portion of its labor force,


\^27 Lester, "Shortcomings of Marginal Analysis For Wage-Employment Problems," p. 81.

\^28 Machlup, "Rejoinder to An Antimarginalist," p. 150.
or, to leave the industry entirely. Regardless of the adjustment process, the marginalists argue that the effects on employment will not differ appreciably from what one would expect from competitive wage theory, i.e., higher wages will result in unemployment.

The Economy of High Wages

Competitive theory states that there is one wage, and one wage only, at which a given number of workers will be employed by a firm, given the capital supply, technology, and product price. This dictum follows from the assumption that labor's physical productivity depends upon the stock and quality of capital and is independent of the wage rate.

Wages, however, are a major determinant of the standard of living, and the standard of living, at least up to some point, does much to determine the productivity of labor. That is, a hungry and miserable worker is likely to produce much less than a worker who is well fed and satisfied although they have similar machines. Therefore, to the extent that

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29Professor Lester's reply to this argument is that: "Because there is no minimum rate of profits and firms losing money may continue to operate at full capacity, it is possible for wages to be forced up at the expense of profits, even in an individual firm, without causing a reduction of employment and investment in that firm either immediately or within one or two decades. Studies of the profits of many corporations show that firms invest new capital in spite of the fact that their rate of profits is lower than that obtaining in other lines of industry, where profits are not only higher but are increasing. Economics of Labor, p. 325."
labor productivity is a function of the wage rate, it will be untrue that only one wage rate will be consistent with a given level of employment: there may be more than one equilibrium position.

Thus it has been widely held that there is "economy in high wages." If the wages of the poor in "sweated industries" are raised, and employers do not instantaneously dismiss workers, their productivity may be so increased (because of an improved standard of living—better health, morale, etc.) that there will be no necessity to reduce employment. Indeed, there may be reason for employment to expand. Thus the minimum wage law can only help low-wage workers: it raises low wages but does not reduce employment opportunities—and may expand them because of the corresponding advance in productivity. 30

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30Pigou writes: "Even when low wages are fair wages, in the sense of being proportioned to efficiency, it does not necessarily follow that a higher wage will not be fair also. For, . . . if only an inefficient worker can be secured good payment for a little while, he or she may be so far improved in efficiency as to become worth the higher wage. Insofar as these things happen, the national dividend will be pro tanto benefitted," The Economics of Welfare (London: Macmillan and Company, 1920), p. 555.

On this subject Rothschild writes: "With a given number of workers and a given supply of capital, the marginal productivity theory seems to fix quite uniquely . . . the equilibrium wage. Any attempt to raise the wage above that level, or press it below it, would set in motion economic forces, viz., competition among the workers or employers, which would sooner or later bring the wage back to its old level. If this does not happen instantaneously, however, i.e., if the wage stays higher for some time, then, the high-wage economists say, something different may happen. The
Diagrammatically the economy of high wages argument can be represented as follows:

Initially, the wage rate is OW and labor's marginal productivity schedule is given by MVP. The corresponding equilibrium level of employment is ON. Suppose that the government imposes a minimum wage in the amount of OW'. If the firm does not immediately reduce employment to ON', as static competitive theory assumes, dynamic changes may be initiated which will make this reduction unnecessary. For, if workers lived in substandard conditions before, the better higher wage and the higher standard of living that goes with it will increase the productivity of the workers. This will, of course, also increase marginal productivity and more workers will be employed at any given wage than before. In the end, because of this increased demand, the same number of workers may be employed at the higher wage as were originally employed at the lower wage. The old equilibrium has been replaced by a new equilibrium. "The Theory of Wages," pp. 29-30.
standard of living made available by the higher wage rate may so improve worker efficiency that the marginal productivity schedule shifts out to MVP —or even farther to the right. Thus, or more, units of labor may be employed after the minimum wage increase.

The economy of high wages argument, although persuasive, does, according to the "orthodox" theorists, contain flaws: First, it seems to ignore the important distinction between employment in terms of human units and employment in terms of efficiency units. As Hicks writes:

An increase in the efficiency in the same proportion as the initial rise in wages does no more than prevent labour-costs from rising as a result of the rise in wages; so that, other things being equal, only the same quantity of labour would be demanded, and since this is being provided by fewer men, there must be a considerable amount of unemployment. 31

Second, while the argument is valid for workers who are "ill-fed, ill-clothed, ill-housed," it can scarcely be of much analytical value for employment problems in modern industrialized nations. 32 For, in the main, these workers long ago attained a level of income high enough to meet physiological needs so that further wage increases would have little

31 Hicks, The Theory of Wages, p. 208.

effect on efficiency—as in all things the principle of diminishing returns is at work. And finally, the economy of high wages argument depends upon an instantaneous improvement in worker efficiency; but, as Bronfenbrenner and others have pointed out, improvements in worker productivity are likely to take years rather than weeks. And if their improvement in productivity is slow in materializing, and if competitive conditions hold, some of the workers will not remain employed long enough to benefit from the higher wages. Then those who become unemployed may suffer a deterioration in efficiency and be much worse off than they were initially.

The Shock Model

The economy of high wages argument states that there may be several wage rates which are consistent with a given

33 "... when wages are low, a rise in wages may improve efficiency very greatly; but there is in this matter a law of diminishing returns. The difference between a very low level of wages and one slightly higher will inevitably be spent to a very considerable extent on 'necessities' -- in the sense of things which are necessary to keep a man in a fully fit condition.

But as wages rise, this proportion must decline.

... After wages have reached a certain level, only a few men will spend any further upon things which promote their efficiency as workers." Hicks, The Theory of Wages, pp. 96-97.

34 "It is also important to observe that the favourable effects on efficiency must show themselves fairly rapidly if
level of employment because worker productivity is a function
of the wage rate. This argument must be distinguished from
another labor productivity proposition which contends that,
"when a wage increase is imposed management may be shocked
into greater efficiency leading to greater output per worker,
thereby offsetting the cost increase resulting from the
higher wage rate."\(^{35}\)

This shock model, as expounded by Richard A. Lester,
is an extension of the argument that most firms have technically
fixed labor requirements.\(^{36}\) Lester writes:

Replies from thirty-three firms to a questionnaire
given to fifty Southern business firms concerning
the relative role of different factors in determining
their employment, alterations in their variable costs
per unit with changes in the rate of output, and their
probable adjustments to an increase in wages relative

\(^{35}\)Moess, Local Subsidies For Industry, p. 208.

\(^{36}\)R. H. Tawney, "The Establishment of Minimum Rates
in the Chain Making Industry Under the Trade Board Act of
1909 (1914)"; and Reynolds, "Toward a Short-Run Theory of
Wages, p. 297, discuss the shock effects of imposed wage
increases on management efficiency.
to those paid by competing producers indicated that, on the average, unit variable costs (to say nothing of overhead per unit) increase about 25 percent with a drop in the scale of plant operations from 100 percent to 70 percent of capacity. If employers could and would calculate marginal labor costs (which seems generally not to be the case in modern, large-scale industry), it would, therefore, not be rational for them to adjust to higher wages by deliberately reducing output (the scale of plant operations) as marginalists frequently assume employers would do in reaction to an increase in their wage scale relative to scales paid by competitors. 37

The largest remaining area of adjustment is what might be called 'better management', including such matters as the selection, flow, and treatment of materials, the scheduling of production, organization of the work, better shift arrangement, regularizing sales and employment, etc..........................

Actually there is a large volume of experience in the South and elsewhere indicating that real improvements in management, sometimes following alterations in management personnel, have occurred when one or more firms have been forced to raise wage scales because of the threat of unionism, the certification of a union as bargaining agent after an organizing campaign, or minimum wages resulting from governmental action. Part of the relative improvement in management in the affected firms would have been profitable before the higher wage scale took effect. Marginalists are prone to overlook the marked differences in management efficiency and the fact that management personnel, and not the workforce, may be altered when the firm's operations are unprofitable. The management stimulating effects of independent firm increases in wages and of higher minimum wages are common knowledge in business circles in the South. Moreover, answers of executives of 43 Southern firms indicated that the 'shock' of a relative wage increase in a low-wage section of an industry may frequently lead to increased sales efforts and thus perhaps expand sales, production

and employment beyond the volume that otherwise would prevail—a result completely opposite to the expectations of the marginalists. 38

Only the most adamant of the "marginalists" would deny that an imposed wage increase could result in an improvement in managerial efficiency. To do so, would, as Douglas puts it, be a complete acceptance of the "concept of the omniscient and untiring economic man." 39 Marginalists, however, do deny that much in the way of relief can be expected along these lines. For in the first place, as in the "high wage model," an increase in worker productivity—in this instance because of improved management—in the same proportion as the initial rise in wages will leave the demand for labor unchanged in efficiency units and therefore represent a drop in the demand for men. Also, this improvement in productivity must come soon after the wage increase or the firm will be forced down some other path of adjustment. If possible, the firm will raise prices which will reduce sales and consequently employment, or, it will reduce its demand for labor by installing labor-saving machinery or by leaving the industry entirely. 40 Again, the orthodox theorists maintain


40 "Certainly Trade Union[and Wage Board] pressure will force entrepreneurs to look about them, to reorganise.
that the employment effects of a minimum wage increase will be as the competitive model predicts, shock effects not withstanding.

Summary

In summary, there are several alternate models of the firm which predict minimum wage consequences quite different from those given by the competitive wage model. The general hypothesis drawn from these models is that a firm will either maintain the same level of employment or increase its workforce (assuming exogenous influences on employment remain constant) when the government orders it to pay higher wages. Therefore all the low-wage workers affected by the minimum benefit and poverty is reduced to this extent.

and to introduce 'up to date' methods. But at best these activities can only slightly raise the marginal productivity of labor, and so only slightly weaken the effectiveness of the forces tending to unemployment. For reorganisation is bound to have a bias in favour of labour-saving changes; its effect on the marginal productivity of capital is bound to be much more favourable than its effect on the marginal productivity of labour." Hicks; The Theory of Wages, p. 204.

On this subject John Moes writes: "Moreover, effecting gains in efficiency may at least in part take the form of labor-saving measures so that the unemployment problem can be aggravated even if output falls little or not at all. In the case at hand it would be quite natural if managerial ingenuity should turn in that direction." Local Subsidies For Industry, p. 20.
CHAPTER IV

EMPIRICALLY TESTABLE HYPOTHESES

Theoretically, then, the 1967 minimum wage order in the laundry, cleaning and dyeing industry may or may not have had those effects which are intended by the Fair Labor Standards Act. Wage theory is split on this issue. On the one hand, competitive theory indicates that poverty among the workers of the laundry, cleaning and dyeing industry must have been made more acute following the imposition of the higher wage because jobs would have been eliminated and workers idled. But on the other hand, non-competitive theory suggests that poverty would have been ameliorated by the minimum because higher incomes would have been attained without any reduction in employment.

While this theoretical discussion has been inconclusive, it has provided a framework and suggested an approach for an empirical investigation. Clearly, to reach some judgement as to the welfare effects of the minimum wage in the laundry, cleaning and dyeing industry, some method must be found for testing the validity of the opposing wage-employment hypotheses. For if it can be empirically demonstrated that the higher wage resulted in a loss of employment (the competitive
hypothesis), one may conclude that poverty was not reduced and that the Fair Labor Standards Act does not appear to have accomplished its objective in this case. Of course, the converse also holds true. Let us drop the discussion of wage theory, therefore, and now consider how the employment effects of the 1967 minimum wage order may be inductively determined.

**Changes in Total Industry Employment**

If the firms of an industry behave as though they are competitive, it follows from theory that one could expect to observe a reduction in total industry employment following a minimum wage increase, other things remaining equal. Conversely, if these firms behave as non-competitors, total industry employment would remain unchanged, or, increase under some conditions. However, as has been mentioned earlier, it is unlikely that the effects on employment of the minimum wage can be observed by comparing changes in aggregate employment. For things rarely remain the same even for very short periods of time: labor supply and demand are constantly changing. And since the 1967 minimum wage order required only modest cost increases in the laundry, cleaning and dyeing industry, any changes in total industry employment could scarcely be attributed to the influence of the minimum wage.
The Cross-Section Hypotheses

A cross-section analysis of wage and employment changes among firms in the same industry, however, is a means of isolating the short-run employment effects of the minimum wage that avoids some of these difficulties. Exogenous influences can cause labor supply and demand to move in any direction for the industry as a whole, or for particular firms, without biasing the results; provided that these changes are uniformly or randomly distributed among firms with respect to the imposed wage increases. The essential assumption in the cross-section study, therefore, is that firms are homogeneous except for the differences in the measurable variables of the problem and a random error, e.g., imposed wage changes and employment changes. It is important, of course, to make some empirical check or judgement on the probable validity of this assumption.¹

¹That is, before one wage-employment hypothesis can be accepted and another rejected; consideration must be given to the part played by on-going employment trends in producing the observed results.

This cross-sectional model has been used by others in the past to estimate the employment effects of minimum wage increases. The most statistically sophisticated of these studies have been conducted by Professor John M. Peterson, "Employment Effects of Minimum Wages, 1938-50," *JPE*, Vol. 65 (October, 1957), pp. 412-30.

While Professor Peterson found a negative wage-employment relationship in all the cases he studied, and thus concluded that the competitive hypothesis had been confirmed, his investigation of the influence of prior employment trends appears, at least on the surface, to have been less than adequate. That is, little if any
If minimum wage laws have negative employment effects, which is the competitive hypothesis, then, given a source of initial variation in the wages paid by the firms of an industry, a cross-section comparison will reveal an inverse relation between wage increases imposed by a minimum wage and employment changes among these firms. That is, high-wage firms whose wages increase little or not at all may have net increases or only small decreases in employment. Low-wage firms whose wages increase more will have smaller increases or larger decreases in employment. Thus a regression line of employment changes on wage changes will have a negative slope and will be in the form

\[
\frac{(N_1 - N_0)}{N_0} = a + b \frac{(w_1 - w_0)}{W_0}
\]

evidence is presented in his studies to show that the cross-sectional data does not contain a bias favoring the competitive hypothesis.


These cross-sectional studies have also tended to confirm the competitive hypothesis. However, the BLS has not only failed to present statistical evidence of past trends, it has failed to employ even primitive inferential statistical techniques so that one cannot assess the significance of the observed results.

where \( N_0 \) and \( W_0 \) are employment and wages before the minimum, and \( N_1 \) and \( W_1 \) are employment and wages after the minimum, and \( b \), the regression coefficient, is negative and differs significantly from zero.\(^2\)

This result will be manifest only if (a) exogenous influences on employment do not strongly favor low over high-wage firms (the competitive cross-section hypothesis in general assumes that employment trends are similar between the wage groups); and (b) if the elasticity of substitution of capital for labor is not much larger for high than for low-wage firms (the competitive cross-section hypothesis in general assumes that the elasticity of substitution is constant between firms). If employment trends favor low-wage firms, and (or) the elasticity of substitution is greater in high-wage firms, the regression coefficient would be low, and could be zero or even positive.\(^3\)

\(^2\)An inverse relation between wage and employment changes is only consistent with what one would expect from an industry of competitive firms. This result would not prove that the industry is comprised of firms who are competitive buyers and sellers—it would not be a rigorous test of the competitive model itself. To test the model one would first have to derive the production function and the elasticity of substitution for this industry. However, this need not trouble us since our purpose is simply to test the validity of the negative wage-employment hypothesis drawn from the competitive model.

\(^3\)The converse also holds true. If employment trends favor high-wage over low-wage firms, and (or) the elasticity of substitution is greater among low-wage than high-wage firms, the regression coefficient will be higher than would otherwise be the case.
If, however, minimum wage laws do not have negative employment effects, which is the non-competitive hypothesis, then, given a source of initial variation in the wages paid by firms of an industry, a cross-section comparison will reveal either no functional relationship between imposed wage increases and employment changes among these firms, or, if there is a relationship it will be direct rather than inverse. That is, high-wage and low-wage firms will have similar employment changes, or, low-wage firms may have more favorable changes. A regression line of employment changes will therefore have a slope that is either not significantly different from zero or that is positive.

Again, this cross-sectional hypothesis assumes that exogenous employment influences are neutral in their effects. If on-going trends in employment strongly favor high-wage over low-wage firms, a valid test of this hypothesis could not be made.  

The Cross-Section Hypotheses for the Laundry, Cleaning and Dyeing Industry

From 1959 to 1966, total employment in the laundry, cleaning and dyeing industry grew by 5 percent. During

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4 Because the essence of the non-competitive hypothesis is that firms do not make negative employment adjustments to imposed wage increases, it is not necessary to make an assumption about inter-firm differences in the elasticity of substitution between capital and labor.

this period employment in power laundries fell by 11 percent but grew by 12 percent in the cleaning and dyeing branch of the industry. Thus the competitive cross-section minimum wage hypothesis implies that low-wage power laundries should have suffered greater reductions in employment than high-wage power laundries following the 1967 minimum wage order, ceteris paribus. In the cleaning and dyeing segment of the industry, this hypothesis would imply that low-wage plants should not have expanded employment as rapidly as the high-wage plants following the minimum. And for the laundry, cleaning and dyeing industry as a whole, the cross-section implication of the competitive hypothesis is that employment in low-wage plants should have remained unchanged, or fallen, or grown slightly, while employment in high-wage plants expanded after the imposition of the minimum.

On the other hand, the non-competitive cross-section minimum wage hypothesis asserts that low-wage plants should have experienced similar changes in employment, or suffered smaller reductions, or enjoyed greater increases than medium and high-wage plants following the 1967 minimum wage order, ceteris paribus.

It should be noted here that the laundry, cleaning and dyeing industry consists of more than power laundries and cleaning and dyeing plants. The industry also includes linen supply services, rug cleaning plants, industrial laundries, diaper services, hand laundries, self-service laundries, and cleaning and pressing shops. However, power laundries and cleaning and dyeing plants accounted for 70 percent of the total workforce of 524,197 in 1966.
CHAPTER V

PROCEDURE FOR THE EMPIRICAL INQUIRY

There are several practical requirements which must be met if the validity of the competitive and non-competitive cross-sectional minimum wage hypotheses are to be empirically tested:

First, the industry in question must have been affected by the minimum wage law. The minimum rate cannot lie below the wages which were actually paid by all the firms. If this condition is not met and the minimum was not effective, the conclusion in a test situation would be no effect when in fact no test of either hypothesis had occurred.

Second, there must be cross-sectional data available for this industry so that wage and employment levels for a large number of employment units can be compared before and after the imposed wage increase.

Third, the data must be available at points in time so that the period of comparison is not likely to be dominated by influences other than the minimum wage itself—anticipatory, cyclical, seasonal, and secular influences should be minimized. The cross-section method of analysis is relevant only when the period of comparison is short. As it becomes longer there is a rapidly mounting likelihood that other influences will
dominate employment changes.

Fourth, there must be historical data available for the various employment units so that wage related employment trends can be identified and some judgement can be made as to their importance in determining the observed relationship between wage and employment changes.

And fifth, it is desirable, although not absolutely necessary, that employment in the industry be measured in the more precise terms of man-hours rather than in numbers of workers. Employment adjustments to a minimum wage may occur in both, neither, or just one of these variables.

The Laundry, Cleaning and Dyeing Industry

All of these requirements but the last can be realized in an empirical study of the employment effects of the 1967 minimum wage order in the laundry, cleaning and dyeing industry.

As was mentioned much earlier, the laundry, cleaning and dyeing industry was substantially affected by the 1967 minimum wage order, particularly in the South. In mid 1966, 13.6 percent of the total workforce of 540,106 in this industry earned less than $1.00 an hour and 34.4 percent of the workers in the South earned less than this amount.1

County Business Patterns, a publication of the U.S. Department of Commerce (Bureau of Census), reports total pay-

1"Industry Wage Survey-Laundry and Cleaning Services Mid 1966."
roll and labor force estimates for the laundry, cleaning and
dyeing industry on a county-wide and state-wide basis for
the first quarter of every year. By a simple process of
division using these data and data showing the average
number of hours worked by the laundry, cleaning and dyeing
industry in the quarter; the average wage rate of an employee
in a county or a state employment unit can be computed. Since
these data are available for a period before and after the
imposition of the 1967 minimum, there is a basis for cross-
section comparisons of wage and employment changes (in terms
of men not hours) in high, medium, and low-wage employment
units. These units can be either county-wide or state-wide.

The data from County Business Patterns pertain to the
first quarter of every year. There is no reason therefore to
believe that the data for two years should be unequally affec-
ted by seasonal factors. Because the Fair Labor Standards
Act was not amended until August of 1966 and there is data

2 These estimates are a statistical byproduct derived
from employment and payroll information reported on Treasury
Form 941, Employers Quarterly Federal Tax Return. Thus the
estimates theoretically include all workers who are covered
by the Federal Insurance Contributions Act (Social Security).
In the laundry, cleaning and dyeing industry this is nearly
100 percent of the workforce.

3 Estimates of the average hours worked per quarter in
this industry can be obtained from "Employment and Earnings
Labor (BLS). However, these estimates are for the industry
as a whole and cannot be obtained on a state-wide or county-
wide basis. Thus hours worked cannot be considered a variable
for the first quarter of that year, the initial survey period should not include any anticipatory effects. Since the Law did not become effective until February 1, 1967, and there are data on employment for March 15th, 1967, the time period should be short enough to minimize exogenous influences on employment. This is important since in the 1966-67 period the U. S. economy was experiencing a rapid rate of growth in total demand and in prices so that the modest increase in real wages required by the minimum could soon have been offset.

While choosing a very short interval between the effective date of the minimum wage and the final survey period minimizes the influence of exogenous economic factors on industry employment, it cannot insure that the employment changes that did occur among the employment units between March 15th, 1966 and March 15th, 1967, were the result of the imposed wage increase rather than on-going wage related trends. However, because County Business Patterns is available for a number of years in the past, employment trends for the various high, medium, and low-wage employment units can be identified and some judgement can be made as to their importance in contrib-

but serve only to transform quarterly earnings in the various employment units into average hourly earnings.
uting to the observed pattern of employment changes in the survey period. 4

With this information in hand, we are now ready to proceed with an empirical test of the competitive and non-competitive cross-section minimum wage hypotheses. We will use linear regression analysis and analysis of wage related employment trends first to study the relationship (if any) between wage and employment changes in the laundry, cleaning and dyeing industry as a whole, in power laundries, and in cleaning and dyeing plants on a state-wide basis for the period March 15th, 1966 to March 15th, 1967. We will next direct our attention to the South where wage and employment changes in the industry, in power laundries, and in cleaning and dyeing plants will be compared on a county-wide basis for the same period.

4Comparable employment data is available in County Business Patterns for the years 1959, 1962, 1964, 1965, 1966, and 1967. This means that a time series regression to reveal differential employment trends would have just five observations and three degrees of freedom for determining a t value, which is not very satisfactory. Therefore, realizing the risks involved, we will use compound growth rates from 1959 to 1966, and from 1964 to 1966 to check on the existence of such trends. A "long-run" and a "short-run" period are used because this avoids some of the error that is involved when "end points" are used for prediction.
CHAPTER VI

FINDINGS AND ANALYSIS

Case I - The Laundry, Cleaning and Dyeing Industry - Forty-Nine States

Analysis of Wage and Employment Changes

In the first quarter of 1966, 65,448 laundry, cleaning and dyeing workers in eight states earned an average wage of $1.20 an hour, 244,852 workers in twenty-nine states earned an average wage of $1.50 an hour, and 213,897 workers in twelve states earned an average of $1.92 an hour. One year later, one and one-half months after the effective date of the minimum wage order, the wages of the first group had risen by 15 percent to $1.38 an hour, the second group's wages had increased by 8 percent to $1.62 an hour, and the last group's wages were up 6.25 percent to $2.04 an hour.

1 Data for Maryland in 1967 was not available.
2 These wage groupings, while arbitrary, will expedite the analysis.
3 Data obtained from the "1963 Census of Business, Selected Services Area Statistics," U.S. Department of Commerce (Bureau of Census) shows that the ratio of total wages to total receipts in the laundry, cleaning and dyeing industry (regardless of the wage rate) is on average .41. Thus these wage increases represent a 6.15 percent, a 3.28 percent, and a 2.56 percent increase in total costs respectively if employment went unchanged.
A comparison of employment changes between these two periods reveals that low-wage states had less favorable changes than high-wage states, although medium-wage states had the most favorable changes. The actual changes (from low to high-wage states) were: -.53 percent, 1.80 percent, and 1.07 percent. An analysis of the changes in the forty-nine separate states gives a regression coefficient of -.251 (S_p = .126) and a coefficient of determination (R^2) of .078. The t ratio is -1.998; this indicates a significant negative linear relationship between wage and employment changes at the .05 level when a z test is used (z_{.05} = -1.96), but does not quite do so when a t test is used (t_{.05(45)} = -2.02).\(^4\)

Analysis of Wage Related Employment Trends

Over the seven year period from 1959 to 1966, low, medium, and high-wage states alike expanded their employment in the laundry, cleaning and dyeing industry. The average annual percentage rates of increase were .7 percent, .5 percent, and .9 percent respectively.

During the two year period immediately prior to the minimum (1964 to 1966), growth in employment was more rapid. The average annual percentage rate of increase was 2.36 percent.

for low-wage states, 2.72 percent for medium-wage states, and 2.40 percent for high-wage states. As has been shown above, the rates of change for these groups the following year (1966-1967) were -.53 percent, 1.80 percent, and 1.07 percent respectively. The difference in these annual rates is then -2.89 percent for the low-wage states, -.92 percent for the medium-wage states, and -1.33 percent for the high-wage states.

Therefore, it would appear that on-going trends in employment in this industry can neither account for the inverse relationship between wage and employment changes observed in the cross-section study nor the absolute fall in employment in the low-wage states.

Case II - Power Laundries - Forty-Nine States

Analysis of Wage and Employment Changes

In the first quarter of 1966, 42,077 power laundry workers in ten states earned an average wage of $1.16 an hour; 53,560 workers in twenty-six states earned $1.50 an hour; and 70,780 workers in thirteen states earned $1.85 an hour. In March of 1967, after the minimum wage was imposed, the first group's wages had risen 12.93 percent to $1.31 an hour; the second group was earning 6.67 percent more or $1.60 an hour; and the last group's wages had risen by 6.49 percent to $1.97 an hour.5

5The ratio of total wages to total receipts in power laundries (again, regardless of the wage rate) is on average
A comparison of employment changes between 1966 and 1967 shows that power laundries in low-wage states had less favorable employment changes than power laundries in high-wage states, although, again, medium-wage states had the most favorable changes. The actual changes in employment (from low to high-wage states) were: -6.39 percent, -1.92 percent, and -3.04 percent. An analysis of the changes in the forty-nine separate states given a regression coefficient of -.648 ($S^2 = .114$) and an $R^2$ of .406. The $t$ ratio of -5.672 indicates a highly significant negative linear relationship between wage and employment changes ($t_{.01}(45) = -2.690$).

Analysis of Wage Related Employment Trends

In the period from 1959 to 1966, low, medium, and high-wage states alike experienced a decline in power laundry employment. This decline was most severe in the low-wage states. The average annual percentage rate of decrease for low-wage states was -2.3 percent; this compared with -1.1 percent for medium-wage states and -1.5 percent for high-wage states.

Between 1964 and 1966, the picture was quite different. The average annual percentage rate of change in power laundry employment in low-wage states was -1.25 percent, for medium-...
wage states it was 29 percent, and for high-wage states it was -2.18 percent. Between 1966 and 1967, when the minimum wage became effective, the rates were -6.79 percent, -1.92 percent, and -3.04 percent respectively. The difference in these annual percentage rates (1964-66 and 1966-67) is then -5.14 percent for low-wage states, -2.21 percent for medium-wage states, and -2.86 percent for high-wage states.

Thus if there is any bias in the data used in the cross-section study, it is slight. There is certainly nothing in the employment history of these wage groups which could account for the sharp reduction of employment in the low-wage group in the 1966 to 1967 period, or the marked difference in employment experience between the groups in this period.

Case III - Cleaning and Dyeing Plants - Forty-Eight States

Analysis of Wage and Employment Changes

In March of 1966, 42,134 cleaning and dyeing workers in twelve states earned an average wage of $1.14 an hour, 113,744 workers in twenty-eight states received an average wage of $1.46 an hour, and 65,805 workers in eight states were paid an average wage of $1.85 an hour. In March of 1967, the first group's wages had risen by 12.28 percent

Data for Alaska in 1967 was not available.
to $1.28 an hour, the second group's wages were up 7.53 percent to $1.57 an hour, and the last group's wages had increased by 5.95 percent to $1.96 an hour. 7

A comparison of employment changes between these two periods reveals that low-wage states had less favorable changes than high-wage states, and that medium-wage states had the most favorable changes. These changes (from low to high-wage states) were: .90 percent, 1.41 percent, and 1.28 percent. An analysis of the changes in the forty-eight separate states gives a low regression coefficient of -.162 ($b = .180$) and an R² of just .017. The t ratio of -.900 indicates that there is no significant negative linear relationship between wage and employment changes here (t.10(45) = -1.68).

Analysis of Wage Related Employment Trends

Between 1959 and 1966, low, medium, and high-wage states saw an expansion of employment in cleaning and dyeing plants. There was, however, some difference in the individual rates of growth. The average annual percentage rates of increase were 2.4 percent, 1.3 percent, and 1.7 percent

The ratio of total wages to total receipts in cleaning and dyeing plants at all wage levels averages .41 (as in the industry as a whole). Thus these wage increases would represent a 5.03 percent, a 3.08 percent, and a 2.43 percent increase in total costs respectively if employment went unchanged.
respectively.

The trend favoring low-wage states also prevailed in the 1964 to 1966 period. The average annual percentage rate of increase in cleaning and dyeing plant employment was 4.74 percent in low-wage states, for medium-wage states it was 3.89 percent, and for high-wage states it was 2.75 percent. Between 1966 and 1967, the rates of increase for these groups fell to .90 percent, 1.41 percent, and 1.28 percent respectively. The difference in these annual rates is then -3.84 percent for low-wage states, -2.48 percent for medium-wage states, and -1.47 percent for high-wage states.

From this analysis it appears that the employment data used in the cross-section study was biased against the competitive minimum wage hypothesis. Trends both in the short and long-run periods favored low-wage states over medium and high-wage states. Thus while the regression coefficient did not differ significantly from zero in this case, it may well have in the absence of these biasing trends.

Case IV - The Laundry, Cleaning and Dyeing Industry - Three Hundred and Fifty-Six Counties

Analysis of Wage and Employment Changes

In March of 1966, 16,416 laundry, cleaning and dyeing workers in one hundred and sixteen southern counties earned

These counties were located in fifteen southern states. The states included in the South were: Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas,
an average wage of $0.99 an hour, 64,081 workers in one hundred and sixty-four counties received an average wage of $1.27 an hour, and 70,353 workers in seventy-six counties earned an average wage of $1.53 an hour. In March of 1967, the workers in the first group were earning 19.19 percent more or $1.18 an hour, the second group's wages were up 11.81 percent to $1.42 an hour, and the last group was earning 7.84 percent more at $1.65 an hour.9

A comparison of employment changes between these two periods reveals that low-wage counties had less favorable changes than medium-wage counties which in turn had less favorable changes than high-wage counties. The actual changes were -3.21 percent, .04 percent, and 4.02 percent respectively. An analysis of the changes in the three hundred and fifty-six separate counties gives a regression coefficient of -0.418 ($b = .070$) and an $R^2$ of .092. The t ratio of -5.978 indicates a highly significant negative linear relationship between wage and employment changes ($t_{.01}(300) = -2.59$).

Analysis of Wage Related Employment Trends

Historical employment data extending back to 1959 on Virginia, and West Virginia.

9Using a ratio of wages to total cost of .41, these wage increases would represent a 7.86 percent, a 4.84 percent, and a 3.21 percent increase in total costs respectively if employment went unchanged.
a county-wide basis is not complete, particularly for low-wage counties. However, there is historical data for 248 out of the 356 counties used in the cross-section study. An analysis of the employment levels in these counties reveals that between 1959 and 1966, the average annual percentage rate of change in employment was -.2 percent for low-wage counties, .8 percent for medium-wage counties, and 1.7 percent for high-wage counties.

Between 1964 and 1966, the average annual rate of growth in laundry, cleaning and dyeing industry employment in low-wage counties was 1.86 percent, for medium-wage counties it was 2.46 percent, and for high-wage counties it was 3.09 percent. Between March of 1966 and March of 1967, the rates of change in employment for these groups were -3.21 percent, .04 percent, and 4.02 percent respectively. The difference in these annual rates (1964-66 and 1966-67) is then -5.07 percent for the low-wage counties, -2.42 percent for the medium-wage counties, and .92 percent for the high-wage counties.

Thus while employment trends both over the long and short-run periods favored the competitive cross-section hypothesis, the intensity and direction of these trends clearly do not account for the very different employment experience of low, medium, and high-wage counties in the 1966 to 1967 period, or the absolute decline in employment in both low and medium-wage counties.
Case V - Power Laundries - Eighty-Three Southern Counties

Analysis of Wage and Employment Changes

In the first quarter of 1966, 4,680 power laundry workers in twenty southern counties earned an average wage of $0.99 an hour, 19,192 workers in forty-three counties earned an average of $1.25 an hour, and 10,444 workers in twenty counties had average hourly earnings of $1.57. One year later the workers in the first group were earning 14.14 percent more or $1.13 an hour, the second group's wages had risen by 12.00 percent to $1.40 an hour, and the third group's wages had increased by 2.55 percent to $1.61 an hour.

A comparison of employment changes between these two periods shows that low-wage counties had less favorable changes than medium-wage counties and they less favorable changes than high-wage counties. These changes were -12.52 percent, -4.48 percent, and 2.06 percent respectively. An analysis of the change in the eighty-three separate counties gives a regression coefficient of -0.607 ($b = 0.131$) and an $R^2$ of 0.210. The t ratio of -4.634 indicates a highly significant

Separate data for power laundries and cleaning and dyeing plants is not available for many of the smaller counties.

Using a ratio of wages to total costs of 0.51, these wage increases would represent a 7.21 percent, a 6.12 percent, and a 1.30 percent increase in total costs respectively if employment went unchanged.
negative linear relationship between wage and employment changes (t.01(80) = -2.64).

Analysis of Wage Related Employment Trends

In the period from 1959 to 1966, low, medium, and high-wage counties alike experienced a decline of employment in power laundries. The average annual percentage rates of decrease were -1.9 percent, -2.1 percent, and - .6 percent respectively.

Between 1964 and 1966, the average annual rate of decrease in power laundry employment in low-wage counties was -2.40 percent, in medium-wage counties it was -1.07 percent, and in high-wage counties it was -1.05 percent.

From March of 1966 to March of 1967, the rates of change in employment for these groups were -12.52 percent, -4.48 percent, and 2.06 percent respectively. The difference in these annual rates is then -10.12 percent for the low-wage counties, -3.41 percent for the medium-wage counties, and 3.11 percent for the high-wage counties.

Therefore, although the employment data used in the cross-section study may have contained some element of bias favoring the competitive hypothesis, on-going trends in employ-

12 Historical data was available for only seventy-eight out of the eighty-three counties used in the cross-section study.
ment clearly cannot account for the dramatic fall in employment in 1967 in low-wage and medium-wage counties, or the marked difference in employment experience between these wage groups in this period.

Case VI - Cleaning and Dyeing Plants -
One Hundred and Seventy-Five Southern Counties

Analysis of Wage and Employment Changes

In March of 1966, 9,338 cleaning and dyeing workers in fifty-two southern counties earned an average wage of $1.02 an hour, 26,585 workers in eighty-six counties were earning an average wage of $1.25 an hour, and 18,516 workers in thirty-seven counties were earning an average wage of $1.53 an hour. In March of 1967, wages for the first group had risen by 16.67 percent to $1.19 an hour, wages for the second group were up 9.60 percent to $1.37 an hour, and for the last group they were up by 5.88 percent to $1.62.13

A comparison of employment changes between these two periods reveals that low-wage counties had less favorable changes than medium-wage counties and that they in turn had less favorable changes than high-wage counties. The actual changes were -1.49 percent, 2.45 percent, and 3.30 percent respectively. An analysis of the changes in the one hundred

13 Using a ratio of wages to total cost of .41, these wage increases would represent a 6.83 percent, a 3.93 percent, and a 2.41 percent increase in total costs respectively if employment went unchanged.
and seventy-five separate counties gives a high regression coefficient of \(-0.717 (S_b = 0.122)\) and an \(R^2\) of 0.167. The t ratio of -5.882 indicates a highly significant negative linear relationship between wage and employment changes (\(t_{01}(150) = -2.61\)).

**Analysis of Wage Related Employment Trends**

In the seven year period from 1959 to 1966, low, medium, and high-wage southern counties expanded employment in cleaning and dyeing plants.\(^\text{14}\) The average annual percentage rates of increase were 3.1 percent, 1.3 percent, and 4.3 percent respectively.

Between 1964 and 1966, the average annual rate of increase in cleaning and dyeing plant employment in low-wage counties was 3.84 percent, for medium-wage counties it was 3.95 percent, and for high-wage counties it was 6.09 percent. From March of 1966 to March of 1967, the rates of change in employment for these groups were -1.49 percent, 2.45 percent, and 3.30 percent respectively. The difference in these annual rates is then -5.33 percent for low-wage counties, -1.50 percent for medium-wage counties, and -2.79 percent for high-wage counties.

Again, while on-going trends in employment could account

\(^{14}\) Historical data was available only for one hundred and fifty-eight out of the one hundred and seventy-five counties used in the cross-section study.
for some of the observed inverse relationship between wage and employment changes in southern cleaning and dyeing plants for the period March 1966 to March 1967, these trends do not seem to explain the absolute reduction in employment in low-wage counties or their very different employment experience from that of the other wage groups in this period.

Tables 1 through 5 present the results of the cross-section and employment trend analyses for these six minimum wage cases.
TABLE 1

WAGE AND EMPLOYMENT CHANGES IN STATES BY WAGE GROUPS, 1966-67

<table>
<thead>
<tr>
<th>March 1966</th>
<th>March 1967</th>
<th>Percentage Change to March 1967</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Hourly Earnings</td>
<td>No. of States</td>
<td>No. of Workers</td>
</tr>
<tr>
<td>Laundries, Cleaning and Dyeing (49 States)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below $1.30 (AV. $1.20)</td>
<td>8</td>
<td>65,448</td>
</tr>
<tr>
<td>$1.30-$1.69 (AV. $1.50)</td>
<td>29</td>
<td>244,852</td>
</tr>
<tr>
<td>Above $1.69 (AV. $1.92)</td>
<td>12</td>
<td>213,897</td>
</tr>
<tr>
<td>Power Laundries (49 States)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below $1.30 (AV. $1.16)</td>
<td>10</td>
<td>42,077</td>
</tr>
<tr>
<td>$1.30-$1.69 (AV. $1.50)</td>
<td>26</td>
<td>53,560</td>
</tr>
<tr>
<td>Above $1.69 (AV. $1.85)</td>
<td>13</td>
<td>70,780</td>
</tr>
<tr>
<td>Cleaning and Dyeing (48 States)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below $1.30 (AV. $1.14)</td>
<td>12</td>
<td>42,124</td>
</tr>
<tr>
<td>$1.30-$1.69 (AV. $1.46)</td>
<td>28</td>
<td>113,744</td>
</tr>
<tr>
<td>Above $1.69 (AV. $1.85)</td>
<td>8</td>
<td>65,805</td>
</tr>
</tbody>
</table>
TABLE 2

WAGE AND EMPLOYMENT CHANGES IN SOUTHERN COUNTIES
BY WAGE GROUPS, 1966-67

<table>
<thead>
<tr>
<th>March 1966</th>
<th>March 1967</th>
<th>Percentage Change to March 1967</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Hourly Earnings</td>
<td>No. of Counties</td>
<td>No. of Workers</td>
</tr>
<tr>
<td>Laundries, Cleaning and Dyeing (Southern Region - 356 Counties)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below $1.11 (AV. $ .99)</td>
<td>116</td>
<td>16,146</td>
</tr>
<tr>
<td>$1.11-$1.39 (AV. $1.27)</td>
<td>164</td>
<td>64,081</td>
</tr>
<tr>
<td>Above $1.39 (AV. $1.53)</td>
<td>76</td>
<td>70,353</td>
</tr>
<tr>
<td>Power Laundries (Southern Region - 83 Counties)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below $1.11 (AV. $ .99)</td>
<td>20</td>
<td>4,680</td>
</tr>
<tr>
<td>$1.11-$1.39 (AV. $1.25)</td>
<td>43</td>
<td>19,192</td>
</tr>
<tr>
<td>Above $1.39 (AV. $1.57)</td>
<td>20</td>
<td>10,444</td>
</tr>
<tr>
<td>Cleaning and Dyeing (Southern Region - 175 Counties)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below $1.11 (AV. $1.02)</td>
<td>52</td>
<td>9,338</td>
</tr>
<tr>
<td>$1.11-$1.39 (AV. $1.25)</td>
<td>86</td>
<td>26,585</td>
</tr>
<tr>
<td>Above $1.39 (AV. $1.53)</td>
<td>37</td>
<td>18,516</td>
</tr>
</tbody>
</table>
**TABLE 3**

REGRESSION EQUATIONS OF WAGE AND EMPLOYMENT
CHANGES IN STATES AND IN SOUTHERN

<table>
<thead>
<tr>
<th>Equation</th>
<th>Constant Term</th>
<th>Coefficient</th>
<th>R^2</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Laundries, Cleaning and Dyeing (49 Observations)</td>
<td>2.313</td>
<td>-.251</td>
<td>.078</td>
<td>-1.998**</td>
</tr>
<tr>
<td>2-Power Laundries (49 Observations)</td>
<td>1.258</td>
<td>-.648</td>
<td>.406</td>
<td>-5.672**</td>
</tr>
<tr>
<td>3-Cleaning and Dyeing Plants (48 Observations)</td>
<td>1.502</td>
<td>-.162</td>
<td>.017</td>
<td>- .900</td>
</tr>
<tr>
<td>4-Laundries, Cleaning and Dyeing (356 Observations)</td>
<td>5.688</td>
<td>-.418</td>
<td>.092</td>
<td>-5.973**</td>
</tr>
<tr>
<td>5-Power Laundries (83 Observations)</td>
<td>1.884</td>
<td>-.607</td>
<td>.210</td>
<td>-4.634**</td>
</tr>
<tr>
<td>6-Cleaning and Dyeing Plants (175 Observations)</td>
<td>10.268</td>
<td>-.717</td>
<td>.167</td>
<td>-5.882**</td>
</tr>
</tbody>
</table>

* significant at the .05 level
** significant at the .01 level
TABLE 4

AVERAGE ANNUAL PERCENTAGE RATES OF CHANGE IN EMPLOYMENT IN STATES FOR THE PERIODS 1959 TO 1966, 1964 TO 1966, AND 1966 TO 1967 BY WAGE GROUPS.

<table>
<thead>
<tr>
<th></th>
<th>Laundries, Cleaning &amp; Dyeing</th>
<th>Power Laundries</th>
<th>Cleaning &amp; Dyeing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low-Wage</td>
<td>Medium-Wage</td>
<td>High-Wage</td>
</tr>
<tr>
<td>8 States</td>
<td>29 States</td>
<td>12 States</td>
<td>10 States</td>
</tr>
<tr>
<td>(1) 1959 to 1966</td>
<td>.7%</td>
<td>.5%</td>
<td>.9%</td>
</tr>
<tr>
<td>(2) 1964 to 1966</td>
<td>2.36</td>
<td>2.72</td>
<td>2.40</td>
</tr>
<tr>
<td>(3) 1966 to 1967</td>
<td>-.53</td>
<td>1.80</td>
<td>1.07</td>
</tr>
<tr>
<td>(4) (3) - (2)</td>
<td>-2.89</td>
<td>-.92</td>
<td>-1.33</td>
</tr>
</tbody>
</table>
### TABLE 5

**AVERAGE ANNUAL PERCENTAGE RATES OF CHANGE IN EMPLOYMENT IN SOUTHERN COUNTIES FOR THE PERIODS 1959 TO 1966, 1964 TO 1966, AND 1966 TO 1967 BY WAGE GROUPS**

<table>
<thead>
<tr>
<th></th>
<th>Laundries, Cleaning &amp; Dyeing</th>
<th>Power Laundries</th>
<th>Cleaning &amp; Dyeing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low-Wage</td>
<td>Medium-Wage</td>
<td>High-Wage</td>
</tr>
<tr>
<td>1959 to 1966</td>
<td>108 Co.'s</td>
<td>157 Co.'s</td>
<td>77 Co.'s</td>
</tr>
<tr>
<td>(1)</td>
<td>- .2%</td>
<td>.8%</td>
<td>1.7%</td>
</tr>
<tr>
<td>1964 to 1966</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2)</td>
<td>1.86</td>
<td>2.46</td>
<td>3.09</td>
</tr>
<tr>
<td>1966 to 1967</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3)</td>
<td>-3.21</td>
<td>.04</td>
<td>4.02</td>
</tr>
<tr>
<td>1967 to 1968</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4)</td>
<td>-5.07</td>
<td>-2.42</td>
<td>.92</td>
</tr>
</tbody>
</table>

(1) - (2)
CHAPTER VII

SUMMARY AND CONCLUSIONS

Summary of Findings

An analysis of cross-sectional data from the laundry, cleaning and dyeing industry and its two major branches has revealed that employment changes following the 1967 minimum wage order were generally inversely related to wage increases imposed by the minimum. This was true when employment units were grouped according to wage levels or analyzed separately, both nationally and within the South.

In four of the six cases studied (all facets of the industry in the South and power laundries nationally) the observed negative linear relationship between wage and employment changes among the separate employment units was significant at the .01 level. While some evidence was found which indicates that in three out of four of these cases low-wage employment units had historically enjoyed less favorable employment changes than one or both of the other wage groups, these differentials were slight and cannot explain the marked reduction in employment in the low-wage units or the very different employment experience of low, medium, and high-wage employment units in the 1966 to 1967 period.

In one of the cases studied (the industry as a whole
on a nation-wide basis) the observed negative linear relationship between wage and employment changes was just significant at the .05 level using a Z test. No evidence could be found here to indicate that wage related employment trends had biased the cross-sectional data in any direction.

And finally, in one case (cleaning and dyeing plants on a nation-wide basis) there was no significant negative linear relationship between wage and employment changes even at the .10 level. However, further analysis here revealed that employment trends had favored low-wage states over medium-wage and high-wage states. The cross-sectional data then likely contained some element of bias against a negative wage-employment relationship and favoring one that was positive.

**Conclusions**

Empirical evidence of minimum wage experience in the laundry, cleaning and dyeing industry is, therefore, inconsistent with the hypothesis that firms either maintain or expand their employment when confronted with externally imposed wage increases. Rather, the evidence strongly suggests that firms in this industry responded to the minimum wage increase in the manner predicted by competitive theory: they immediately reduced their demand for labor and reduced it more the greater was the required wage increase.¹

¹The results of the cross-section study in the laundry, cleaning and dyeing industry are consistent with Professor John M. Peterson's findings on the employment effects of the 1950
The implication of this finding is that in eliminating low-wages in the laundry, cleaning and dyeing industry, the 1967 FLSA wage order also eliminated a considerable amount of employment. And the unemployment observed here was simply the very short-run effect of the minimum wage. Had more time been allowed for adjustments in the production process, it is probable—if competitive wage theory continues to have predictive validity—that further employment reductions would be noted. The rise in the price of labor relative to that of capital would promote a substitution of capital for labor.2

Thus to the extent that one is willing to accept the empirical evidence presented in this study as confirming the minimum wage increase in Southern sawmilling, the men's cotton garment industry, and the seamless hosiery industry. In these industries, Peterson found an inverse relation between wage and employment changes when plants were grouped by wage level and in correlations of data for individual plants. The regression coefficients were -0.331 (r = -0.196, significant at the .01 level); -0.115 (r = -0.295, not quite significant at the .05 level); and -0.254 (r = -0.476, significant at the .01 level) respectively.

2The substitution implications of the competitive wage model have received some inductive verification.

In their study of Puerto Rican economic development, Lloyd G. Reynolds and Peter Gregory found that the minimum wage stimulated firms in the manufacturing sector of this economy to improve managerial efficiency (often by importing more skilled managers from the mainland) and to introduce labor-saving machinery.

To determine the actual employment foregone because of the minimum, Reynolds and Gregory first statistically derived the labor demand elasticity in the manufacturing sector. Through regression analysis of cross-sectional data (wages, employment, and value added) for two separate periods (1949 to 1954, and 1954 to 1958) and by assuming that they were
competitive hypothesis, one might conclude that the 1967 minimum wage order in the laundry, cleaning and dyeing industry aggravated the problem of low income and poverty. Our skepticism prohibits us from making such a claim; however, and we rest our case with the assertion that the imposition of the minimum wage in this industry did not result in an immediate and direct reduction in poverty which is predicted by the various non-competitive wage models and which is intended by the Fair Labor Standards Act. We conclude, therefore, that FLSA failed to realize its objective in the laundry, cleaning and dyeing industry.

dealing with a production function homogeneous in the first degree, Reynolds and Gregory found this elasticity to be approximately one (the regression coefficient was -1.1375 ($S_b = .131$) in the first period and for the second period it was -.939 ($S_b = .2081$)). This means that an imposed wage increase in the Puerto Rican industrial sector could be "expected to be associated with an approximately equal proportionate change in employment in the reverse direction with the wage bill remaining roughly constant." Thus they conclude that as a result of the minimum wage there was an "estimated loss of about 9,000 jobs between 1949 and 1954, and of 29,000 jobs between 1954 and 1958." Wages, Productivity and Industrialization in Puerto Rico, Chapter 3.

David E. Kaun, working with the manufacturing sector of this country, obtained results similar to those of Reynolds and Gregory. He found that as the result of minimum wage increases, industries substituted non-wage inputs for labor in the production process. This substitution was most marked in low-wage industries. There was "a positive relationship between the impact of the minimum wage (as measured by the level of average wages at the start of the period) and the relative reduction in wage inputs in value added." "Minimum Wages, Factor Substitution and the Marginal Producer." Quarterly Journal of Economics, Vol. 79 (August, 1965), p. 483.
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