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Minimum Wage Noncompliance and the Employment Decision

by

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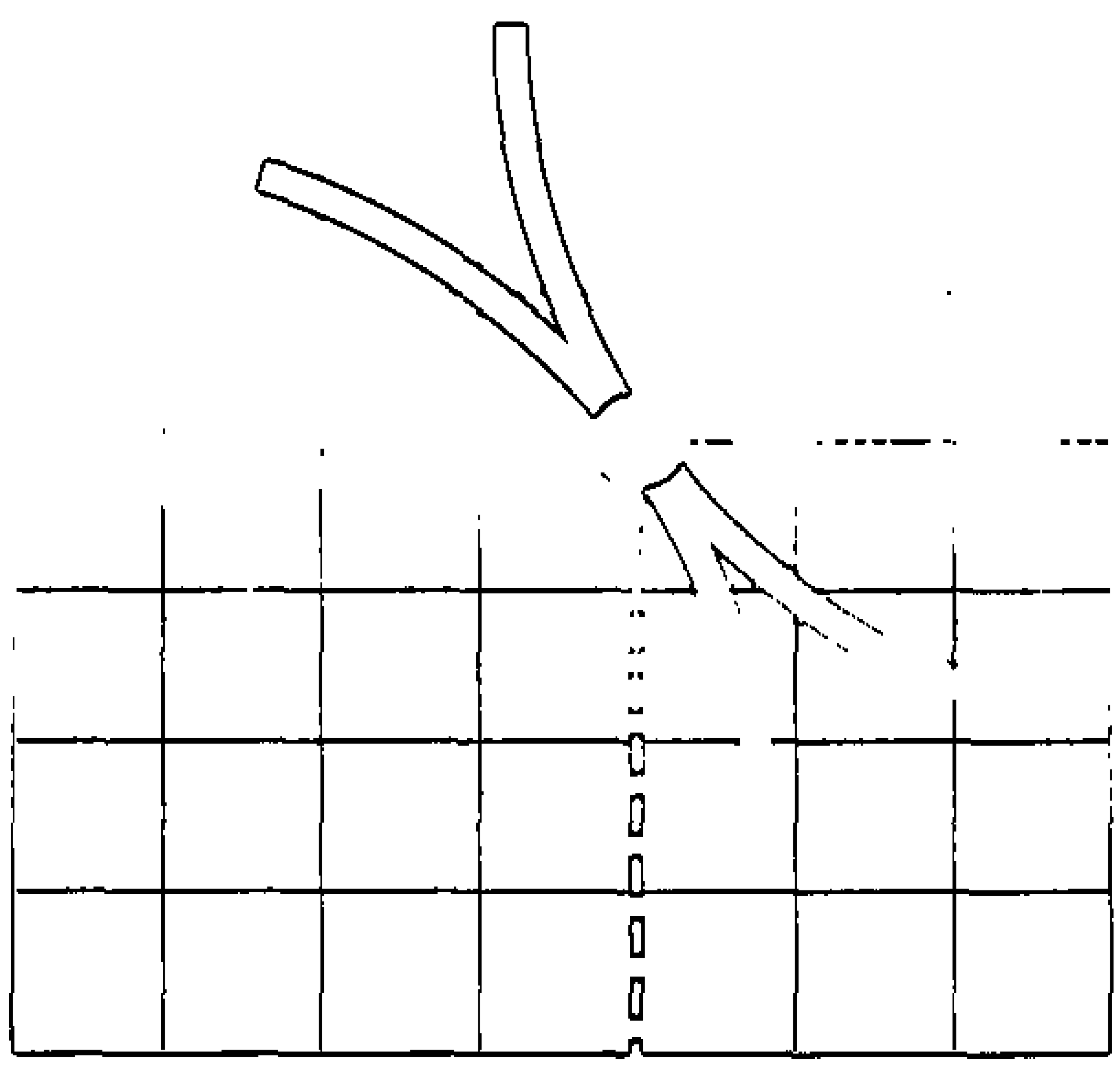

No. 72

Jerusalem, November 1999

Research and Planning Administration

אי-ציות לחוק שכר מינימום והיקף ההעסקה האופטימאלי

מאת

גדעון יניב

תמצית

הספרות העוסקת באי-ציות לחוק שכר מינימום מתמקדת, בין השאר, בהשפעה שיש להחלטה שלא לציית לחוק על היקף ההעסקה של המעביד. המסקנה הרווחת בספרות היא, שאי-ציות לחוק, הכרוך בסיכון להתפס ולהענש, מגדיל את השכר האפקטיבי לעובד מעל לרמת השכר התחרותי ומניע את המעביד להקטין את היקף ההעסקה מתחת לרמה התחרותית. יחד עם זאת, היקף ההעסקה יהיה עדיין גדול יותר מאשר במצב של ציות לחוק. הנחה סמויה העומדת מאחורי המסקנה דלעיל היא שהמעביד מפר את החוק ביחס <u>לכל</u> העובדים. המאמר הנוכחי טוען כי הנחה זו אינה הכרחית, שכן המעביד עשוי להעדיף לציית לחוק ביחס לחלק מן העובדים בלבד – ולא לציית לחוק ביחס לעובדים האחרים. המאמר מציג מודל של ציות חלקי לחוק שכר מינימום ומעלה במפתיע, שאם רמת הציות החלקי נקבעת באורח אופטימאלי, המעביד יקטין את היקף ההעסקה עד לרמת ההעסקה של ציות מלא. במילים אחרות, חוק שכר מינימום עשוי *להביא לצמצום רמת ההעסקה עד לרמה של ציות מלא – גם אם המעביד* אינו מציית באופן מלא לחוק. תוצאה זו, המוכללת בסיום גם לחוקי שוק עבודה אחרים, מערערת את הציפיה האינטואיטיבית, שעובדים ששכרם נופל מחשכר החוקי יצליחו לפחות לשמור על מקום עבודתם.

ירושלים, נובמבר 1999

MINIMUM WAGE NONCOMPLIANCE

AND THE EMPLOYMENT DECISION

by

Gideon Yaniv*

ABSTRACT

The employment effects of minimum wage noncompliance have been the focus of several theoretical contributions to the minimum wage literature. The dominating conclusion seems to be that the non- complying employer will reduce employment below the level corresponding to the free market wage, but will still employ more labor than he would if he had complied with the minimum wage law. An implicit assumption underlying this conclusion is that the non-complying employer violates the law with respect to all his workers. Allowing the employer to choose the level of compliance, the present paper concludes surprisingly that as long as compliance is interiorly optimized, the employer will reduce employment down to the full-compliance level even if he is not fully complying with the minimum wage law. That is, the minimum wage law may give rise to a full-compliance employment effect even if it is partially evaded. This result is further shown to hold with regard to labor market laws in general.

Jerusalem, November 1999

I. Introduction

The employment effects of minimum wage noncompliance have been the focus of several theoretical contributions to the minimum wage literature. Chang and Ehrlich (1985) were first to argue that noncompliance with the minimum wage law raises the marginal cost of labor above the free market wage, inducing the non-complying employer to reduce employment below the competitive level, but to still employ more labor than he would have if he had complied with the law.[1] This conclusion, derived under the assumption that the employer may only choose between paying the statutory minimum and the free market wage, characterizes also the subsequent literature which has allowed the employer to pay less than the minimum but more than the free market rate [e.g., Bloom and Grenier (1986), Chang (1992)]. An implicit assumption underlying these contributions is that the noncomplying employer violates the law with respect to *all* his workers. This, however, is an unnecessary restriction, as employers may find it worthwhile to pay sub-minimum wages to just a fraction of their employed workers, dividing their labor stock between risky and non-risky employment. The present applies a portfolio-choice approach to the employer's non-complying problem, concluding surprisingly that as long as compliance is interiorly optimized, the employer will reduce employment down to the full-compliance level even if he is not fully complying with the minimum wage law. In other words, a minimum wage law may give rise to a full compliance employment effect even if it is partially evaded. This result is further shown to hold with regard to labor market laws in general.

II. The Employment-Compliance Decision

Consider a competitive employer who employs L workers during a given period of time. Suppose that the employer is required by law to pay his workers a minimum wage, m, which exceeds the free market wage, w ($< m$). Suppose, however, that the employer considers the possibility of complying only partially with the minimum wage law, paying the minimum wage to $C(\leq L)$ workers, while paying $L - C$ workers the free market wage.

[1] Ashenfelter and Smith (1979), who were first to analyze the determinants of minimum wage noncompliance, and Grenier (1982), who was first to treat the penalty for noncompliance as a function of the difference between the statutory minimum and the free market wage, ignored the effect on labor employment of the noncompliance decision.

Suppose further that in case of inspection the employer's violation will be detected. He will then be obliged to pay back to each underpaid worker a multiple $k > 0$ of the wage underpayment, $m - w$. Assuming that labor is his only factor of production, the employer's profits in case of non-detection, π^+, and detection, π^-, will be

$$\pi^+ = pf(L) - mC - w(L-C) \tag{1}$$

$$\pi^- = pf(L) - mC - [w + k(m-w)](L-C), \tag{2}$$

where $f(L)$ and p denote the quantity of output, assumed to be a strictly concave function of labor input, and the market price per unit of output, respectively.

The employer may now be assumed to choose the levels of employment, L^*, and compliance, C^*, so as to maximize the expected utility of his prospect

$$EU(\pi) = [1-\varphi(L-C)]U(\pi^+) + \varphi(L-C)U(\pi^-), \tag{3}$$

where $\varphi(L - C)$ represents the probability of inspection, assumed to increase (at non-decreasing marginal rates) with the number of workers receiving less than the minimum [i.e., $\varphi'(L-C) > 0$, $\varphi''(L-C) \geq 0$]. This reflects the fact that government inspection efforts (in the U.S. and other countries) are mainly initiated by workers' complaints of minimum wage violations.[2] Utility, $U(\pi)$, is assumed to be a strictly concave function of profits, implying that the employer is risk-averse.

Differentiating (3) with respect to L and C and rearranging, the first-order conditions for an interior maximum may be written as:

$$EU_L \equiv \frac{\partial[EU(\pi)]}{\partial L} = [pf'(L) - w]EU'(\pi) - \Omega = 0 \tag{4}$$

$$EU_C \equiv \frac{\partial[EU(\pi)]}{\partial C} = -(m-w)EU'(\pi) + \Omega = 0 , \tag{5}$$

[2] See Ashenfelter and Smith (1979). On the factors determining the tendency of underpaid workers to complain, see Yaniv (1994).

where $EU'(\pi) = [1-\varphi(L-C)]U'(\pi^{+}) + \varphi(L-C)U'(\pi^{-}) > 0$ represents the expected marginal utility and $\Omega \equiv k(m-w)\varphi(L-C)U'(\pi^{-}) + \varphi'(L-C)[U(\pi^{+})-U(\pi^{-})] > 0$ represents the expected marginal cost (in utility terms) of noncompliance. This consists of two components, reflecting the assumption that underpaying an additional worker increases not only the penalty due in case of inspection but the probability of inspection as well. Notice that Ω appears in (4) and (5) in opposite signs, since the expected cost of noncompliance is the expected benefit of compliance: while increasing L (for a given level of C) increases the expected cost of noncompliance, increasing C (for a given level of L) increases the expected benefit of compliance. Equation (4) may thus be interpreted as equating the benefit to the employer from paying an additional worker less than his marginal productivity, $[pf'(L) - w]EU'(\pi)$, to the cost of doing so (Ω), whereas equation (5) may be interpreted as equating the cost to the employer from paying an additional worker the statutory minimum, $(m-w)EU'(\pi)$, to the benefit of doing so (Ω).

A sufficient condition for not fully complying with the minimum wage law (i.e., for $C < L$) is that $EU_C < 0$ at C=L, which reduces to $\varphi(0)k < 1$, where $\varphi(0)$ is assumed to be positive (and less than one), allowing for the possibility that the government may initiate an inspection even if no worker complains. This coincides with Chang and Ehrlich's (1985) noncompliance condition and their conclusion that a minimum-wage enforcement policy which requires the non-complying employer to pay back only a fraction of his wage underpayments ($k \leq 1$) will not constitute an effective deterrent for noncompliance. On the other hand, a sufficient condition for complying at least partially with the minimum wage law (i.e., for $C > 0$) is that $EU_C > 0$ at C=0, which requires that $\varphi(L)k > \{EU'(\pi) - \varphi'(L)[U(\pi^{+}) - U(\pi^{-})]\}/ U'(\pi^{-})$, the right-hand-side of which is, by risk aversion, less than one (and may even be negative). An incentive for complying at least partially is thus likely to arise the greater the penalty rate, k, or the higher the marginal probability of detection if fully not complying, $\varphi'(L)$. Notice that if $k > 1$ and $\varphi(L)$ is high, $\varphi(L)k$ may even be greater than one, clearly deterring the employer from underpaying his entire labor force.

Rearranging now equation (4), the optimal level of employment should be determined such that

$$pf'(L^{*}) = w + \frac{\Omega}{EU'(\pi)}\,. \tag{6}$$

Since $\Omega > 0$, equation (6) implies that the non-complying employer will reduce employment below the level corresponding to the free market wage, a result which accords with the recent literature. However, since (5) requires that $\Omega / EU'(\pi) = m - w$, substituting into (6) reveals that

$$pf'(L^*) = m, \tag{7}$$

at the optimum. Hence, the non-complying employer will reduce employment down to the point where the marginal value of output equals the minimum wage.[3]

Equation (7) has two surprising implications: first, as long as compliance is interiorly optimized, the employment decision is actually independent of the level of compliance; secondly, and more importantly, a minimum wage law would induce the employer to reduce employment to the full-compliance level *even if he is not fully complying with the law,* providing that he is able to equate the marginal cost of compliance to the marginal benefit. The literature's result that employment when not complying is different than employment when complying is essentially due to disallowing the employer the freedom of deciding on the level of compliance. Notice that the present result holds even if the employer is allowed to choose the wage he pays when non-complying, as this would only add a third optimum condition to the problem without interfering with the derivation of condition (7). Also, the present result holds irrespective of whether the probability of inspection increases with the number of underpaid workers (i.e., $\varphi'(L - C) > 0$) or whether it is entirely exogenous to the employer (i.e., $\varphi'(L - C) = 0$), as assumed in the noncompliance literature. Furthermore, the present result holds irrespective of whether the penalty rate, k, exceeds one or is just a fraction (as is the case in the U.S. and other countries), which happens to be crucial in determining the employment effect in Chang's (1992) noncompliance model.

[3] The second-order conditions for a maximum, $EU_{LL} < 0$, $EU_{CC} < 0$, and $D \equiv EU_{LL} EU_{CC} - EU_{LC} EU_{CL} > 0$, must hold at $pf'(L^*) = m$. To show this, define $A \equiv [pf'(L) - w][\partial EU'(\pi) / \partial L] - \partial\Omega/\partial L$, which is negative by the concavity assumption on $U(\pi)$ and $f(L)$, and the convexity assumption on $\varphi\ (L-C)$. It then follows that $EU_{LL} = pf''(L)[EU'(\pi)] + A < 0$. Notice now that, when evaluated at the optimum, $EU_{CC} = -EU_{LC}$, $EU_{LC} = EU_{CL}$ (by Young's Theorem), and $EU_{CL} = -A$. Hence, $EU_{CC} = A < 0$. Finally, substituting into D, one obtains $D = \{pf''(L)\ [EU(\pi)] + A\}A - (-A)(-A) = pf''(L)[EU'(\pi)]A > 0$.

Finally, consider the case where $EU_C < 0$ at $C = 0$, so that optimal compliance is obtained at a corner solution where the employer underpays all his workers. Condition (5) implies that $\Omega \,/\, EU\,'(\pi) < m - w$, and substituting into (6) reveals that $pf\,'(L) < m$ at the optimum. In this case only, the non-complying employer will choose to employ more labor than he would if he had fully complied with the minimum wage law. Otherwise, the minimum wage law will result in a full-compliance employment effect even if it is partially evaded.

III. A General Model of the Non-Complying Employer

The last section's result - that full-compliance employment is still optimal even if the employer is not fully complying with the minimum wage law - is not exclusive to minimum -wage law violations, but may be generalized to hold for other labor market laws as well, such as the overtime-pay premium law or the equal pay law, which have not yet been examined in the literature within the framework of a noncompliance decision-making model. To see this, consider a risk-averse employer facing any given labor market law, and denote his profits *if fully complying with the law* by

$$g = g\,(L, \lambda), \tag{8}$$

where λ represents a vector of market and government regulating parameters.[4] The employer's optimal level of employment, $\hat{L}$, whether aiming at maximizing his full-compliance profits or his utility of the latter, will be determined at the point where $g_L(\hat{L}, \lambda) = 0$, given that $g_{LL}(\hat{L}, \lambda) < 0$.

Suppose, however, that the employer considers the possibility of partial noncompliance with the labor market law. Suppose further that not fully complying with the law will yield the employer, if he is not detected, a constant gain, γ, per each worker with respect to

[4] In the case of a minimum wage law, $g(L, \lambda) = pf(L) - mL$. In the case of an overtime-pay premium law, for example, $g(L, \lambda) = pf(L, H) - [w^s H^s + w^p (H-H^s)]L$, where w^s denotes the wage rate per standard work hour, w^p ($> w^s$) - the wage premium per overtime work hour, H^s - the number of standard work hours per worker, and H - the total number of work hours per worker.

whom the law has been violated.[5] However, if his deed is detected, the employer will have to pay a penalty in proportion, k, to his noncompliance gains. His profits in the alternative states, π^+ and π^-, will be

$$\pi^+ = g(L, \lambda) + \gamma(L - C). \tag{9}$$

and

$$\pi^- = g(L, \lambda) - (k-1)\gamma(L - C), \tag{10}$$

respectively. Finally, suppose that the employer's utility function is defined upon his profits only, and that he chooses L^* and C^* so as to maximize the expected utility of his prospect, as defined in (3), subject to (9) and (10). The first-order condition determining the employer's optimal level of employment will be

$$\frac{\partial[EU(\pi)]}{\partial L} = [EU'(\pi)]g_L(L^*, \lambda) - \frac{\partial[EU(\pi)]}{\partial C} = 0 , \tag{11}$$

where

$$\frac{\partial[EU(\pi)]}{\partial C} = -[EU'(\pi) - k\varphi U'(\pi^-)]\gamma + [U(\pi^+) - U(\pi^-)]\varphi' . \tag{12}$$

When compliance is interiorly optimized, (12) holds as an equality. Consequently, condition (11) reduces to $g_L(L^*, \lambda) = 0$, satisfying $L^* = \hat{L}$. Hence, employment will be set at the full-compliance level, irrespective of the labor market law which is violated.[6] While a marginal change in employment now affects the employer's expected utility not only through the full-compliance component of profits, but through the stochastic components of profits as well, this additional effect on expected utility is a multiple (of minus 1) of the effect generated by a marginal change in compliance. Given that the

[5] In the case of a minimum wage law, $\gamma = m - w$. In the case of an overtime-pay premium law, $\gamma = (w^p - w^r)(H - H^r)$. The gain from noncompliance can, in general, be assumed to be an increasing function of the number of workers with respect to whom the law is violated, the minimum wage and overtime-pay premium laws being specific cases for which the gain per worker is constant.

[6] This result also holds when the employer must decide on more than one dimension of employment, as is the case with overtime, where g is a function of L and H. It can be shown that not fully complying with the overtime-pay premium law will keep *both* the number of workers and the number of hours per worker at their full-compliance levels (a proof is available from the author upon request).

employer is able to optimize the latter through summing it up to zero, his problem reduces to the full-compliance one.

There seems to be two prerequisites to this result. First, the penalty for noncompliance must either be a fixed amount [as assumed by Ashenfelter and Smith (1979] or a function of the employer's gains from noncompliance (as assumed in the subsequent literature and in this paper), but not of some other measure of noncompliance in which either L or C (or both) appear separately from $L - C$, such as the *fraction* of underpaid workers in total employment, $(L - C)/L$. Secondly, profits must be the only argument entering the employer's utility function, or, alternatively, there must be no additional argument of the utility function in which either L or C (or both) appear separately from $L - C$. Given, for example, that aside from profits the employer derives direct utility from employment or compliance per se, optimal employment would no longer coincide with the full-compliance level. Consider, for example, the utility function $U(\pi) + \psi(L)$, where $\psi'(L) > 0$. The employer's optimal level of employment if fully complying with the law would then be determined at $g_L(\hat{L}, \lambda) = -\psi'(\hat{L}) / U'[g(\hat{L}, \lambda)]$. If, however, the employer is only partially complying with the law, $\psi'(L)$ would be added to (11). Substituting (12), the optimum condition determining employment would become $g_L(L^*, \lambda) = -\psi'(L^*) / EU'(\pi)$, depending on the level of compliance.

IV. Concluding Remarks

During the past two decades economists have come to realize that in the absence of sufficient enforcement, employers may have incentives not to comply with the minimum wage law. This, on the other hand, has led to the recognition that the adverse effects on employment of a minimum wage legislation may actually be less severe than those anticipated through estimates of downward sloping demand curves for labor, compensating in part for the underpayment of wages. That is, workers who will not be paid the statutory minimum will at least be able to preserve their employment. The present paper seriously doubts this optimistic view, demonstrating that the avoidance aspect (employment reduction) of the minimum wage law is in fact complementary to the evasion aspect (wage underpayment), and is likely to be as severe as that accompanying complete compliance. This strengthens the need for a more stringent enforcement of the minimum wage law, based mainly on initiated inspections rather than on workers' complaints of minimum wage violations. The paper's prediction as regards the violation of other labor market laws may be more optimistic. Considering the overtime-pay premium law, for example, noncompliance, if interiorly optimized, is not likely to interfere with the full-compliance levels of average hours per employee and number of employees hired, thus preserving the deterrent effect of the overtime premium, aimed at inducing employers to substitute employees for overtime.

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