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A Theory of Compliance with Minimum Wage Law

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A Theory of Compliance with Minimum Wage Law

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Abstract

Purpose – In this paper, we introduce firm heterogeneity in the context of a model of non-compliance with minimum wage legislation.

Design/methodology/approach – Theoretical modeling under government compliance policy and wages & employment under non compliance.

Findings – The introduction of heterogeneity in the ease with which firms can be monitored for non compliance allows us to show that non-compliance will persist in sectors which are relatively difficult to monitor, despite the government implementing non stochastic monitoring. Moreover, we show that the incentive not to comply is an increasing function of the level of the minimum wage and increasing function of the gap between the minimum wage and the competitive wage rate.

Originality/value – We have shown why non compliance persists in certain sectors of activity despite frequent inspection by government agencies.

Keywords: Minimum wage legislation; informal sector in LDCs.
***JEL*:** H26, O17

1. Introduction

Received economic theory tells us that an increase in the minimum wage leads to an increase to all wages and thus to unemployment (Jones ,1987, Brown ,1988). The new growth theory for its part has shown in certain contexts, that inequality can be harmful to growth (Alesina and Rodrik, 1994, Persson and Tabellini, 1992), in that the presence of low income

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individuals increases the incentive to tax productive capital. Murphy, Shleifer and Vishny (1989), for their part argue that a low level of demand in conjunction with low levels of remuneration can be an impediment to the adoption of new, and more productive technologies. Cahuc and Michel (1996) construct an endogenous growth model in which higher salaries can stimulate growth in that they encourage the accumulation of human capital, which in the framework of a Lucas-type model of growth leads to a higher growth rate.

At the microeconomic level, it has been shown by Azam (1992) that an increase in the minimum wage in Moroccan agriculture leads to a positive effect on agricultural output, when one uses an efficiency wage model which takes into account the institutional characteristics of a family which shares revenues in order to finance consumption.

While minimum wage legislation may (through the reduction in inequality it entails) have a positive effect on growth, it is not at all certain that firms will respect such legislation. Non-compliance of firms with minimum wage law has been studied in a number of environments. Ashenfelter and Smith (1979) conclude that: (i) the enforcement of minimum wage legislation is incomplete despite the government's inspection efforts not being stochastic, and (ii) the incentives not to comply are increasing in the absolute value of elasticity of the demand of labor. Grenier (1982) finds the opposite result. Chang and Ihrlich (1985) show that both of the preceding results are partially incorrect because the methodological stance they adopt is not appropriate.

Finally, all of the above mentioned studies do not account for the heterogeneity in compliance with minimum wage legislation actually observed in the empirical data. That is, they fail to explain why certain sectors comply while others do not.

The purpose of the present paper is to take this sectoral heterogeneity into account, in the sense that certain sectors are easier to monitor than others. This in turn allows us to show

why non compliance persists in certain sectors of activity despite frequent inspection by government agencies.

2. The Model

Consider an economy constituted by two sectors: a formal sector which respects minimum wage legislation , and an informal sector which does not respect the legislation (and which is competitive). Firms share common production technology, where labor is the only input, given by

$$y = F(l)\,,\; F'(.) > 0, F''(.) < 0 \qquad (1)$$

Labor market regulation is given by a minimum wage $\overline{w}$ for the formal sector. In the informal sector, on the other hand, the competitive wage is given by $w_o < \overline{w}$. In order to insure compliance with minimum wage legislation, firms are subject to inspection. They may be detected as not being in compliance with the minimum wage legislation with probability:

$$q(\zeta) = q\zeta \quad ,\; q \in [0,1], \zeta \in [0,1] \qquad (2)$$

where *q* is the frequency of inspection, and ζ parameterizes the success of this inspection; we assume that the detection technology is uncertain and it depends upon the observability of the activity, the type of evidence available… etc. A firm, which is found to be guilty of paying a wage $w < \overline{w}$ is assumed to have to pay a fine:

$$P = (1 + f)(\overline{w} - w)l \qquad (3)$$

where l is the size of labor which was hired at the below minimum wage , and f is the penalty rate.

We assume that firms which decide not to comply with the minimum wage legislation pay a cost c in order to do so. This cost is assumed to have cumulative density $H(c)$ over the interval $c \in [\underline{c}, \overline{c}]$. Thus, the number of firms which decide not to comply with the minimum

wage legislation is given by those firms whose cost of non compliance satisfied the following weak inequality (4):

$$(1-q)(pF(l)-wl-c)+q(1-\zeta)(pF(l)-wl-c)+q\zeta(pF(l)-wl-c-(1+f)(\overline{w}-w)l)\geq pF(l)-\overline{w}l$$

where p is the market price of the good sold by the firm. It follows that the proportion of firms which do not comply with the minimum wage law is given by:

$$E=\Pr ob(c\leq(1-q\zeta(1+f))[\overline{w}-w]l))=H((1-q\zeta(1+f))(\overline{w}-w)l) \qquad (5)$$

Lemma 1

We have the following statics comparatives:

$$\frac{\partial E}{\partial(\overline{w}-w)}=(1-q\zeta(1+f)lh(.))>0$$

$$\frac{\partial E}{\partial q\zeta}=-(1+f)(\overline{w}-w)lh(.)<0$$

$$\frac{\partial E}{\partial l}=(1-q\zeta(1+f))(\overline{w}-w)h(.)>0$$

3. Wages and Employment Under Non Compliance

In contrast to the existing literature, we assume that wage rate in the sector where the minimum wage law is not respected is determined by a lateral contract between workers and the non compliant firms. Suppose that the workers in the informal sector who are paid a wage $w_o<\overline{w}$ know the distribution of firms that do not apply the minimum wage law and are able to offer them a lateral contract which specifies the wage rate at which they are willing to work for them. The worker offers the contract, the firm may either take it or leave it. The following result characterizes the optimal contract for a simple functional form of the density of non-compliance costs.

Proposition 1

Suppose that $H(c)=c^{\delta}$, $\delta \in [0,1]$ and $c \in [0,1]$. Then the optimal contract is given by:

$$w=\frac{\delta}{1+\delta}w_o+\frac{1}{1+\delta}\overline{w}$$

Proof:

The informal sector worker offers a wage contract to the firm which maximizes his expected rent, whence she solves:

$$Max \underset{w>w_o}{E.}(w-w_o)=H((1-q\zeta(1+f))(\overline{w}-w)l)(w-w_o)$$

The first order condition yields:

$$w=w_o+\frac{1}{1-q\zeta(1+f)}\left(\frac{H((1-q\zeta(1+f))(\overline{w}-w)l)}{h((1-q\zeta(1+f))(\overline{w}-w)l)}\right) \qquad (6)$$

which, combined with the assumption on the functional of the distribution, yields the desired result:

$$w=\frac{\delta}{1+\delta}w_o+\frac{1}{1+\delta}\overline{w} \qquad .(Q.E.D)$$

Proposition 1 shows that the wage offered by the worker to the firms is a weighted combination of the competitive wage and the minimum wage. It is independent of government policy $\langle q, f \rangle$.

Given the lateral contract, employment in the informal sector firms is given by the solution to the following optimization problem:

$$Max \; pF(l_n)-\left(\frac{\delta}{1+\delta}w_o+\frac{\overline{w}}{1+\delta}\right).l_n \qquad (7)$$

its employment yields:

$$l_n=F'^{-1}\left(\frac{\delta w_o+\overline{w}}{p(1+\delta)}\right) \qquad (8)$$

Let l_o be the level of hiring in the competitive sector, and, l_c be the level of hiring in the formal sector which respects the minimum wage legislation. Then we have the following result.

Proposition 2

The hiring levels are such be that : $l_o > l_n > l_c$. ''

Proof:

The result follows directly from the concavity of the production function and the fact that:

$$\overline{w} > \frac{\delta}{1+\delta} w_o + \frac{1}{1+\delta} \overline{w} > w_O \qquad (9) \text{ .(Q.E.D)}$$

4. Government Compliance Policy

The government can affect compliance with the minimum wage law by choosing its instruments $\langle q, f \rangle$, that is the frequency of inspection and the penalty rate. Note that , given the contract offered and accepted by informal sectors, the proportion of firms which operate in the informal sector is given by :

$$E = \Pr ob\left(c \le (1 - q\zeta(1+f))[\overline{w} - w]l\right)) = H\left((1 - q\zeta(1+f))(\overline{w} - w)l\right) =$$
$$H\left(\left(\frac{1 - q\zeta(1+f)}{1+\delta}\right)\delta(\overline{w} - w_O)F'^{-1}\left(\frac{\delta w_o + \overline{w}}{p(1+\delta)}\right)\right) \qquad (10)$$

Hence the following corollary:

Corollary 1

i) The higher the minimum wage, the greater the degree of non-compliance with law

ii) The smaller the wedge dividing the competitive wage and the minimum wage, the lesser is the incentive not to comply with the legislation e.g:

$$\frac{\partial E}{\partial \overline{w}}(.) > 0 \quad \text{and} \quad \frac{\partial E}{\partial w_o}(.) < 0 \qquad (11) \qquad .$$

Proposition 3

$\exists \zeta^o \in]0,1[$ such that the compliance inspection strategy by the government is given by:

$$q = 1 \ \textit{if} \ \ \zeta \le \zeta^o \quad \textit{and} \quad q = \frac{1}{\zeta(1+f)} \quad \textit{othewise} \qquad ."$$

Proof: Note that:

$$E = H\left(\left(\frac{1-q\zeta(1+f)}{1+\delta}\right)\delta(\overline{w} - w_O)F'^{-1}\left(\frac{\delta w_o + \overline{w}}{p(1+\delta)}\right)\right) = 0 \Rightarrow$$

$$1 - q\zeta(1+f) = 0 \Rightarrow q = Min\left(1, \frac{1}{\zeta(1+f)}\right)$$

One obtains the desired result. (Q.E.D)

Proposition 3 shows that in order to obtain full compliance, the policy for the government is to carry out inspection more frequently in those sectors which are more prone to evasion of the minimum wage law.

Corollary 2

Given the inspection effect, the proportion of firms which do not comply with the *minimum* wage legislation is given:

$$E_\zeta = H\left(\left(\frac{1-\zeta(1+f)}{1+\delta}\right)\delta(\overline{w} - w_O)F'^{-1}\left(\frac{\delta w_o + \overline{w}}{p(1+\delta)}\right)\right), \forall \zeta \le \zeta^o$$

$$E_\zeta = 0, \qquad \forall \zeta > \zeta^o$$

.

The corollary confirms the conclusion reached by Ashenfelter and Smith (1979) according to whom non compliance with the minimum wage law persists in spite of non stochastic

inspection policy. The preceding result gives theoretical backing for their conclusion. For a penalty rate:

$$f < \frac{1-\zeta}{\zeta} = f^{o},$$

there will always be non-compliance with the minimum wage law, which lends credence to a penalty of the form suggested by Becker (1968).

4. Conclusion

In this paper we have analyzed the issue of non-compliance with minimum wage legislation in the context of a model which allows for heterogeneity in inspection stemming from the heterogeneity of the activities under monitoring. This uncertainty leads us to our main result which holds that non-compliance persists in a number of sectors, a result which appears to be broadly consistent with available empirical evidence.

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