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Excess Wages Tax

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Abstract

Excess wages tax (EWT) is a tax-based incomes policy instrument introduced in many centrally-planned economies and still used in some FSU and Eastern European countries in transition. The main macroeconomic goal of EWT is to curb inflationary pressures by penalizing through taxation the "excessive" wage awards granted by enterprises in the course of wage and price liberalization. In this paper, effects of EWT on the behavior of a profit-maximizing enterprise under monopsony, its incidence on wages and profits, and its impact on inflation are analyzed. The effect of EWT on an enterprise that maximizes workers' income is also examined with some observations on EWT's impact on managerial behavior. Finally, recent experience with EWT is assessed and compared to that suggested by the model.

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	<u>Page</u>
I. Introduction	1
II. The Profit-Maximizing Enterprise	5
1. The model	5
2. The incidence of EWT	9
3. The incentive to avoid EWT	11
4. The incidence of EWT with two types of labor	12
5. The impact of EWT on inflation	13
III. The Labor-Dominated Enterprise	15
1. Homogeneous labor	15
2. Self-seeking managers	18
IV. The Recent Experience with EWT in FSU and Eastern Europe	21
1. Poland	21
2. Azerbaijan	24
3. Belarus	25
4. Bulgaria	25
5. Estonia	26
6. Hungary	26
7. Kazakhstan	26
8. Kyrgyzstan	27
9. Latvia	27
10. Russia	27
V. Summary and Conclusions	27
Bibliography	30
Appendix I: The profit-maximizing enterprise: comparison of wages and employment without and with EWT with two types (skilled and unskilled) of labor	32
Appendix II: Behavior of $w$ and $w^*$ with respect to $\bar{w}$	36
Appendix III: Self-seeking managers: comparison of the managers' wages without and with EWT	37
Appendix IV: Republic of Bulgaria: Council of Ministers Decree No. 28 of 9 February 1994 on Adopting the Regulations on the Increment and Formation of Wage Funds in 1994	38
Table 1: Some Examples of EWTs, 1992-94	2
Table 2: Poland: Tax Arrears Relative to Taxes Due	22
Table 3: Poland: Average Wages for Selected Months	22
Table 4: Poland: PPWW per Worker	23
Table 5: Bulgaria: EWT	25

### Summary

Excess wages tax (EWT) is a tax-based incomes policy instrument used by some countries in transition. Under EWT, the government taxes the excess of the wage bill above the norm, calculated typically on the basis of inflation and some multiple of the prevailing minimum wage. The main goal of EWT is to curb inflationary pressures by penalizing through taxation the "excessive" wage awards granted by enterprises in the course of wage and price liberalization. This paper examines the effect of EWT on enterprise behavior, wages, and profits, and its possible impact on inflation.

First, EWT's impact on the profit-maximizing enterprise under monopsony is examined as a benchmark. The paper shows that EWT increases the marginal cost of labor. Consequently, although EWT serves to lower the wage award, this is achieved at the cost of lower output and employment, and smaller profits. Also, EWT penalizes more productive enterprises. The impact of EWT on total tax revenue (standard corporate tax revenue plus EWT revenue) is ambiguous because even though the statutory tax base with EWT is broader, taxable profit is smaller. Furthermore, although EWT can curb enterprises' wage awards in the face of inflation, EWT can be pro-inflationary and even result in stagflation, depending on the government's minimum wage policy.

A more realistic model for enterprise behavior in the economies in transition is provided by the labor-dominated enterprise. In this case, with homogeneous labor, it is shown that EWT results in a decline in wages. With heterogeneous labor (managers and workers), wages will also decline, regardless of whether labor shedding is feasible. However, the paper argues that the impact of EWT on wages is moot and that the main determinant of wage awards is the degree of fiscal discipline imposed by the government or the extent to which the government subsidizes the enterprise. It is further argued that EWT does not necessarily curb asset stripping by the employees to pay for larger wage awards.

The experience with EWT in some countries in transition is reviewed briefly. Notably, the evidence from Poland suggests that while EWT has reduced wage awards, it has penalized more productive enterprises, is likely to be highly distortionary, and is not directly correlated with asset stripping. The evidence concerning the impact of EWT on inflation is inconclusive.

The paper suggests that the only role for EWT might be as a temporary measure implemented on the way to privatization and competition. However, even in this role, the distortions introduced would be likely to slow the pace of transition, discourage rapid adaptation, and penalize efficiency and innovation. It is better to control credit expansion, impose credible budget constraints and performance requirements on state-owned enterprises, permit bankruptcy when necessary, and expose the protected enterprises to competition and privatization.

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## I. Introduction

Tax-based incomes policies (TIP) were debated in the economic literature in the late 1970s and early 1980s when the industrial countries went through a highly inflationary period. <sup>1/</sup> A TIP was introduced in France (see below) briefly in 1975 but their serious application was in the socialist centrally planned economies of central and Eastern Europe. The dissolution of the centrally planned economies of the former Soviet Union (FSU) and Eastern Europe and the structural adjustment efforts that followed resulted in inflationary pressures in those countries and a rejuvenated interest in TIP. A policy instrument under the general umbrella of TIP, called the excess wages tax (EWT), has been adopted in one form or another in almost all the FSU and Eastern European countries. An assessment of the theory and practice of the EWT may help inform any future policy makers who may be tempted to experiment.

The application of EWT in the FSU and Eastern European countries is summarized in Table 1. The government sets a "norm" on a quarterly or annual basis that takes into account the projected rate of inflation, often with reference to some multiple of the prevailing minimum wage. Then, the excess of the enterprise's wage bill over and above the norm is taxed at the standard corporate income tax rate, that is, the excess wage bill is not allowed to be deducted as a cost of production. In some countries, the excess wage bill is taxed at special progressive rates (Bulgaria, Estonia, Latvia, Poland).

In most countries, the tax is applied as explained in the following example which is representative of the general practice. <sup>2/</sup> Suppose that the minimum wage, as stipulated by law or as chosen by the government, in units of domestic currency (DC), is DC 800 per month, and a given enterprise employs 100 workers. The workers of the enterprise are paid according to a given wage scale under which many employees are paid wages which exceed the minimum wage. However, by imputing the minimum wage to the existing number of workers, a hypothetical "enterprise minimum monthly wage bill" is calculated as DC 80,000 per month. The law specifies that EWT is applicable when the actual monthly wage bill for all employees (paid at different pay scales at or above the minimum wage) exceeds a certain predetermined multiple of the minimum monthly wage bill. If the predetermined multiple is six, then the relevant threshold is DC 480,000 per month. So, if the actual monthly wage bill of the enterprise is DC 500,000 per month, the difference

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<sup>1/</sup> For an overview of references and collected articles, see Walker (1982), Colander (1986), Fender (1990, Chapter V).

<sup>2/</sup> In this example, the minimum wage may also be viewed as the norm against which "excessive" wage awards are compared, triggering the EWT. Thus, the inflation adjustment of the minimum wage would correspond to the inflation adjustment of the norm. The choice of a one-month tax period for the purposes of this example is arbitrary; in reality, the relevant period is the statutory tax period.

Table 1. Some Examples of EWTs, 1992-94

	Base	Coverage	Norm	Rates	Notes
Armenia	Wage bill	All enterprises	Five times the minimum wage	Taxed at the corporate rate	
Azerbaijan	Wages bill in excess of four times the minimum wage	All enterprises	Four times the minimum wage	Not treated as costs and hence taxed at full corporate rate (35%-70%)	
Belarus	Wage bill	SOE	Four time the minimum wage	Taxed at the corporate rate	Abolished the EWT Nov/Dec. 1992
Bulgaria	Wage bill quarterly	Enterprises with 50 percent and state participation	Excess of quarterly ceiling based on projected inflation and seasonal factors	Progressive rates up to 800 percent	See Appendix IV
Estonia	Average employee compensation	Government sector	Full compensation for targeted inflation (maintained real wage)	Rates for wages in excess of norm 1-3% 200% >3% 400%	Special allowances for price increases in some goods e.g., bread, gas, etc. Abolished June 1993
Hungary	Wages bill increases	Government enterprises	Exceeding the value added of the firm	Not treated as costs and hence taxed at full corporate rate	Abolished EWT January 1992
Kazakhstan	Wages in excess of four times the minimum wage	All enterprises	Four times the minimum wage	Not treated as costs and hence taxed at full corporate rate (35%-70%)	Parliamentary approval sought in May 1992 but rejected
Kyrgyzstan	Wages in excess of six times the minimum wage	All enterprises	Six times the minimum wage	Not treated as costs and hence taxed at full corporate rate (35%)	
Latvia	Wage bill	SOE	Government determined norm for each quarter	1-2% 150% > 2% 350%	If actual inflation exceeds projections by over 10% the target for the following quarter is adjusted. An allowance for productivity is made.
Moldova	Wages bill in excess of four times the minimum wage	All enterprises	Four times the minimum wage	Not treated as costs and hence taxed at full corporate rate (32%-80%)	
Poland	Average wage	SOE	Average wages set by Council of Ministers	Rates for wages in excess of norm: 0-3% 100% 3-6% 200% > 6% 300%	(a) exemptions can be negotiated (b) SOE <u>reducing</u> average employment can increase wage norm by half wage norm lost due to employment reduction
Russia	Quarterly wage bill		Six times the monthly minimum wage	Taxed at corporate rate 32%	
Turkmenistan	Wages bill in excess of four times the minimum wage	All enterprises	Four times the minimum wage	Not treated as costs and hence taxed at full corporate rate (32%-60%)	

of DC 20,000 is added to the reported profit of the enterprise to be taxed at the standard enterprise profits tax rate. For example, if the monthly reported profit of the enterprise were DC 100,000, then its taxable profit including the EWT base would be calculated at DC 120,000. Thus, if the tax rate were 40 percent, the enterprise's tax liability would be increased from DC 40,000 to DC 48,000.

The main macroeconomic goal of EWT is to curb inflationary pressures in the economy by penalizing through taxation the "excessive" wage awards granted by the managers of state-owned enterprises (SOEs) during the course of wage and price liberalization. An EWT can be seen as a sort of bridge between completely planned and executed wage norms and awards by SOEs and full market determination of wages. In practice, in most countries, the emphasis is on modifying the willingness of SOE managers to pay larger wage increases. With relaxed or no price constraints enforced through a national plan, enterprise managers can buy industrial peace and possibly reap personal gain by increased wage awards. The presumption is that SOE managers, often in a protected dominant market position, once price control is lifted, can pass on cost increases to the consumer. So, although SOEs are allowed to determine wages, EWT penalizes and, supposedly, helps restrain excessive wage awards. Similarly, worker behavior in demanding higher wages also is supposed to be modified in consideration of EWT. Thus, if EWT can be expected to lower wages, it might be intended to serve as an indirect policy tool to lower unemployment and restrain cost-push inflation.

Additionally, EWT may serve as a temporary tool in the course of the transition to a full market economy. The SOEs in the FSU and Eastern European countries are huge employers and the breakdown of COMECON has shattered their markets and abruptly reduced the demand for their products. If, in addition, SOEs had to face international competition, the unemployment consequences might be deemed unacceptable. Therefore, it may be argued that, during the transition, SOEs must be allowed to continue operating in a protected market, which allows them to pass forward costs. Consequently, "unreasonable" costs or "excessive" wage awards must be controlled to curb inflationary pressures, hence EWT. Nevertheless, this line of reasoning begs the question of how the government will force SOEs to become more competitive and profitable and whether EWT can be instrumental in this process. The real problem is the lack of competition in wage and price determination and the main issue is the determination and success of the government in encouraging competition through implementing a hard budget constraint on SOEs. If governments were prepared to allow SOEs to operate in truly competitive markets for goods and factors, then the successful enterprises could reward labor and management as they wished. However, it appears that EWT by itself does nothing to encourage competition and greater efficiency. In contrast, it may be argued that EWT appears to trap SOEs like the fly in amber in a semi-permanent non-competitive state without imposing an appreciable constraint on their inefficiency. Therefore, the underlying and unstated intent of EWT might be allowing SOEs to continue operating in an inefficient manner.



Although not necessarily and specifically designed to do so, EWT can also be seen as a tool to encourage private sector growth. In many countries, in particular, in Eastern Europe (Bulgaria, Estonia, Latvia, Poland), EWT applies only to the state-owned sector. The underlying assumption behind this practice seems to be that, in an economy dominated by non-competitive public enterprises, the private sector, in its infancy, needs incentives for growth and profit-maximization motive should be allowed to take root in that sector.

It has also been argued that EWT may have a preventive impact on malfeasance by the SOE managers and workers through asset stripping. During the course of privatization, the property rights are rather ambiguous and the SOE managers may be tempted to sell the assets of SOEs to pay large wage increases to the workers--or at least the favored workers. EWT may help reduce the incentive for such asset stripping by penalizing excess wage awards.

Finally, EWT may be instrumental in generating additional tax revenue by indirectly serving, in essence, as a surtax on corporations over and above the standard corporate income tax. However, although relatively significant revenues are collected from EWT in some countries, the revenue that can be generated by EWT appears to be limited. <sup>1/</sup> A relatively small increase in the standard corporate income tax rate would be sufficient to generate additional revenue to more than match the revenue potential of most EWT.

Conceptually, EWT may achieve one or more of its explicit or implicit goals. There are two main drawbacks. First, in the second-best context in which EWT should be evaluated, its superiority (lower excess burden) over an alternative TIP scheme has to be argued on highly theoretical grounds and is therefore difficult to demonstrate in an empirically measurable way. For example, if the goal is to curb "excessive" wage awards by affecting management and labor behavior, instead of EWT, a portion of the wages may be paid under a profit sharing agreement. Then, if the enterprise is making losses, the workers participate in the enterprise's losses by taking proportionate wage cuts. <sup>2/</sup> Further, it is not immediately apparent why the use of a conventional tax tool would create greater distortions and therefore be inferior to EWT or any other TIP scheme. If the goal is increasing output and employment levels and encouraging the private sector, this may be achieved by providing a conventional set of tax incentives to

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<sup>1/</sup> For example, in Russia such revenue amounted to about 5.0 percent of budget revenue in 1993/94 (or 30 percent of the corporate tax yield). In contrast, in Kyrgyzstan revenue from EWT made up less than 2 percent of enterprise profits tax revenue in 1991.

<sup>2/</sup> This arrangement would be similar to wage indexation; see, Gray (1976). For a discussion of profit-sharing arrangements and their macroeconomic impact, see Weitzman (1984, 1985); on the same subject, also see Nordhaus (1988) and Weitzman's (1988) rejoinder.

the more productive enterprises and sectors in the economy. If the goal is to increase government revenue, this may be achieved by means of resorting to a more familiar menu of conventional taxes. Then, with sufficient expenditure restraint, higher government revenue may reduce recourse to inflationary finance and help lower inflation. The second drawback of EWT is the administrative difficulties it may pose in application. For example, it is difficult to discern how much of the workers' wages above the minimum wage or the norm is to be deemed "excessive" and how much should be attributable to inflation adjustment or increases in productivity.

This paper analyzes the impact on enterprise behavior of a simplified version of EWT and examines whether such a tax can actually contribute toward some of its apparent general goals. A model of the impact of EWT on the behavior of the profit-maximizing enterprise is presented in Section II along with an analysis of the incidence of EWT and its possible impact on inflation. While the profit maximization motive may be unrealistic in the case of SOEs, this model provides a benchmark for the analysis of the more realistic case of the labor-dominated enterprise. Under an alternative specification that the enterprise maximizes workers' income, the effects of EWT on enterprise behavior are examined and some observations on the impact of EWT on managerial behavior are presented in Section III. The experience with EWT in some FSU and Eastern European countries is discussed in Section IV, and concluding remarks are presented in Section V. Some technical proofs are presented in the appendices I, II, and III. In addition, in appendix IV the text of the Bulgarian decree on the "Increment and Formation of Wage Funds in 1994" is presented as an example of legislation and regulations.

## II. The Profit-Maximizing Enterprise

### 1. The model

This model assumes that profit maximization motive dominates corporate behavior. This assumption may not be very suitable to examine the behavior of SOEs in the transition economies. Nevertheless, it provides a framework for a first-order analysis of the impact of EWT and is pertinent due to the ongoing reform efforts to restructure and privatize SOEs in the process of transition to a competitive market system in which the profit motive is dominant.

Let us assume that the representative enterprise employs  $l$  types of labor,  $n_i$ ,  $i = 1, 2, \dots, l$ , and each type of labor is paid the nominal wage,  $W_i$ . Further assume that capital,  $k$ , is homogeneous, the return to capital accrues to the enterprise  $1/l$ , and the enterprise produces a single

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1/ The state-owned enterprise may totally or partially transfer the returns to capital to the government. In this case, if EWT affects profit, total government receipts (the government's share of profits plus taxes) are also affected.

good which it sells in a competitive market at price  $p$ . Let the production function be

$$f(k, n_1, n_2, \dots, n_\ell) \quad (1)$$

$$f_k > 0 ; f_{n_i} > 0 , i = 1, 2, \dots, \ell.$$

The total (real) wage bill of the enterprise can be expressed as

$$\sum_{i=1}^{\ell} w_i n_i \quad (2)$$

where  $w_i = W_i/p$ . Assuming that the corporate income tax is levied at a single rate,  $0 < \tau < 1$ , the enterprise profit,  $\pi$ , is

$$\pi = (1-\tau)[f(\cdot) - \sum_{i=1}^{\ell} w_i n_i] \quad (3)$$

Suppose the economy-wide minimum wage is determined by the government at  $\bar{w}$ . 1/ Hypothetically, if all types of labor were paid the minimum wage, the enterprise's total wage bill would be

$$\bar{w} \sum_{i=1}^{\ell} n_i \quad (4)$$

where  $\bar{w} = \bar{W}/p$ . EWT is triggered if the total wage bill, as expressed in (2), exceeds a predetermined multiple,  $\alpha \geq 1$ , of the hypothetical wage bill calculated at the minimum wage, as expressed in (4). Therefore, the EWT base is

$$\left( \sum_{i=1}^{\ell} w_i n_i - \alpha \bar{w} \sum_{i=1}^{\ell} n_i \right) \quad (5)$$

to be taxed at the standard corporate income tax rate,  $\tau$ . 2/ Then, the enterprise after-tax profit with EWT,  $\pi^*$ , is

1/ For simplicity, the minimum wage can be viewed as the norm or inflation adjusted average wage, as determined by the government.

2/ Modeling a progressive corporate income tax (Azerbaijan, Kazakhstan, Moldova) or progressive taxation of the excess wage bill (Poland, Estonia, Latvia) would not affect the general analytical results below.

$$\begin{aligned}\pi^* &= (1-\tau)\left[f(\cdot) - \sum_{i=1}^{\ell} w_i n_i\right] - \tau\left(\sum_{i=1}^{\ell} w_i n_i - \alpha \bar{w} \sum_{i=1}^{\ell} n_i\right) \\ &= (1-\tau)f(\cdot) - \left(\sum_{i=1}^{\ell} w_i n_i - \tau \alpha \bar{w} \sum_{i=1}^{\ell} n_i\right)\end{aligned}\tag{6}$$

The analysis can be simplified if we assume  $k$  is constant, labor is homogeneous ( $\ell = 1$ ), and  $\alpha = 1$ . <sup>1/</sup> Under these assumptions, (3) and (6) simplify to, respectively,

$$\pi = (1-\tau)[f(n) - wn]\tag{7}$$

$$\begin{aligned}\pi^* &= (1-\tau)[f(n) - wn] - \tau(w - \bar{w})n \\ &= (1-\tau)f(n) - (w - \tau\bar{w})n\end{aligned}\tag{8}$$

where  $k$  is suppressed.

a. Competitive labor market

If the profit maximizing enterprise were facing a perfectly competitive labor market, with or without EWT, the enterprise would take  $w$  as given and maximize profit by choosing  $n$ . Then, from (7) and (8), the equilibria without and with EWT are

$$f_n = w\tag{9}$$

$$f_n^* = \frac{w - \tau\bar{w}}{1 - \tau}.\tag{10}$$

where  $f_n$  and  $f_n^*$  are respectively the marginal product of labor without and with EWT. Notice that if  $w \leq \bar{w}$ , the minimum wage becomes the wage floor which the enterprise takes as given to maximize profit by choosing  $n$ . Then, as is clear from (9) and (10), with  $w = \bar{w}$ ,  $f_n = f_n^*$  hence  $\pi = \pi^*$ , that is, EWT has no impact on enterprise behavior. If  $w > \bar{w}$ , the comparison of the right-hand-side of (9) and (10) shows that marginal cost with EWT is higher than without EWT; then, as is generally true,  $f_n < f_n^*$ , hence  $n > n^*$ , and  $f(n) > f(n^*)$ . Therefore, although in a competitive labor market EWT has no impact on the wage level, it reduces the amount of labor employed by the enterprise and output. It is also interesting to note that the closer  $\bar{w}$

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<sup>1/</sup> The heterogeneous labor case which allows for a distinction between managers and workers is discussed below; for the case of  $\alpha > 1$ , see appendix I.

to the market wage,  $w$ , the closer the output level with EWT to the output level without EWT, and conversely (see Section II.5).

b. Monopsonist enterprise

Since the main purpose of imposing EWT is presumably to discourage "excessive" wage awards by the enterprise, in order to conjecture that the enterprise has the leeway to affect the wage rate, we need to assume that the enterprise has monopsony power. We assume that the enterprise takes  $\bar{w}$  as given and may not pay a wage below it, however, as a monopsonist, the enterprise may choose to pay a wage exceeding  $\bar{w}$  and bear the implied EWT liability. This assumption implies that labor supply is less than perfectly elastic. Accordingly, let us further assume that labor supply is a function of  $w$  as in

$$n^S = n(w) \quad (11)$$

where  $\partial n/\partial w = n' > 0$ . Suppose the enterprise pays an excess over and above  $\bar{w}$  such that

$$w = \bar{w} + b ; w^* = \bar{w} + b^* ; b, b^* \geq 0 \quad (12)$$

where, respectively,  $w$  and  $w^*$  are the wages and  $b$  and  $b^*$  are the excesses over the minimum wage paid without and with EWT.

Maximizing (7) with respect to  $w$  and making use of (11) and (12), the profit maximizing levels of  $w$  and  $b$  without EWT are

$$w = \frac{\theta}{1+\theta} f_N ; b = \frac{\theta}{1+\theta} f_N - \bar{w} \quad (13)$$

where  $\theta = (w/n)n'$ , which is the elasticity of supply of labor. Similarly, maximizing (8) with respect to  $w$  and making use of (11) and (12), we can show that the profit maximizing levels of  $w$  and  $b$  with EWT are

$$\begin{aligned} w^* &= \frac{\theta}{1+\theta} [(1-r)f_N + r\bar{w}] ; \\ b^* &= \frac{\theta}{1+\theta} (1-r)f_N - \frac{\bar{w}}{1+\theta} [1+\theta(1-r)] \end{aligned} \quad (14)$$

In order to focus on EWT's impact on the wage award by the enterprise, we shall restrict the analysis in the rest of Section II to the monopsonist

enterprise case which allows for greater scope in examining the impact of EWT on "excessive" wage awards. <sup>1/</sup>

## 2. The incidence of EWT

Let us first examine the case where  $\theta = 0$  or labor supply is perfectly inelastic. In this case, (13) and (14) imply that  $b = b^* = 0$  since  $b, b^* \geq 0$  by assumption; hence  $w = w^* = \bar{w}$ , that is, the monopsonist enterprise pays the lowest wage possible. Therefore,  $\pi = \pi^*$  and the equilibrium wage and employment levels are not affected by EWT.

To examine the intermediate case when  $0 < \theta < \infty$ , let us first note from (7) that the total (effective) cost of production without EWT is  $C = (1-\tau)wn$ ; hence the marginal cost is

$$g = (1-\tau)(n + w n') \quad (15)$$

Similarly, (8) indicates that the total (effective) cost of production with EWT is  $C^* = (w - \tau \bar{w})n$ ; hence the marginal cost is

$$g^* = (n + wn') - \tau \bar{w} n' \quad (16)$$

Comparison of  $g$  and  $g^*$  shows that, as in the competitive labor market case,

$$g < g^* \quad (17)$$

for all  $w > \bar{w}$ . The enterprise maximizes profit by equating marginal cost to marginal revenue. Notice that, with or without EWT, the net marginal product is plotted by  $(1-\tau)f_n n'$  for all  $w \geq \bar{w}$ . Therefore, in equilibrium,

$$w^* < w ; b^* < b ; n^* < n \quad (18)$$

where  $n^*$  is the equilibrium level of employment with EWT corresponding to

<sup>1/</sup> We shall not attempt to compare the monopsony case to the competitive labor market case since it is well-known that the equilibrium with monopsony is inferior to that which obtains with a competitive labor market. However, the main conclusions that are derived for the monopsony case can be readily extended to the competitive labor market case.

$w^*$  and  $n$  is the equilibrium level of employment corresponding to  $w$  1/. Hence the output level with EWT is less than the output level without EWT.

As regards the profit level, comparison of (7) and (8) in equilibrium shows that maximum profit with EWT,  $\pi^*_{\max}$ , is less than maximum profit without EWT,  $\pi_{\max}$ , that is,

$$\pi^*_{\max} = (1-\tau)[f(n^*) - w^*n^*] - \tau(w^* - \bar{w})n^* ;$$

$$\pi_{\max} = (1-\tau)[f(n) - wn] ; \quad (19)$$

$$\pi^*_{\max} < \pi_{\max}$$

unambiguously; (19) holds since  $w > w^*$  or the wage level at which (7) is maximized is not the same as  $w^*$ . 2/

It may also be noted that EWT penalizes more productive enterprises. From (13), we can show that, without EWT, for the enterprise to pay  $w > \bar{w}$ ,

the marginal product of labor needs to be such that  $f_n > \bar{w} \frac{(1+\theta)}{\theta}$ . But

with EWT, for  $w^* > \bar{w}$ , (14) indicates that it is necessary to have

$$f_n > \bar{w} \frac{1+\theta(1-\tau)}{\theta(1-\tau)}, \text{ and, for constant } \theta, \frac{1+\theta(1-\tau)}{\theta(1-\tau)} > \frac{1+\theta}{\theta} .$$

First suppose the enterprise's (labor) productivity without EWT is such that it pays the minimum wage; then, the enterprise is unaffected by the imposition of EWT. Now suppose that the enterprise productivity without EWT

is such that  $\frac{1+\theta}{\theta} < f_n < \bar{w} \frac{1+\theta(1-\tau)}{\theta(1-\tau)}$ ; then, with EWT, the enterprise pays

the minimum wage. Only if the enterprise productivity is high enough such

1/ Comparing  $g$  and  $g^*$  at the same values for the wage rate, we can show that  $g < g^*$  if  $n + (w - \bar{w})n' > 0$ , which holds if  $w > \bar{w}$  as assumed. We also assume that the second-order condition for profit maximization holds in both cases, that is, in equilibrium,  $\partial[(1-\tau)(n')f_n]/\partial w$  is less than  $\partial g/\partial w$  and  $\partial g^*/\partial w$ . Thus, the marginal product curve intersects  $g$  and  $g^*$  from above on the plane where the vertical axis measures the marginal product and marginal cost and the horizontal axis measures labor ( $n$ ). Therefore, since  $g < g^*$ , the value of  $n$  at  $(1-\tau)f_n n' = g^*$ , is less than the value of  $n$  at  $(1-\tau)f_n n' = g$ , that is, the amount of labor demanded with  $g^*$  is less than the amount of labor demanded with  $g$ , or  $n^* < n$ . Since  $n' > 0$ , on the  $(w, n)$  plane,  $n^* < n$  indicates  $w^* < w$ .

2/ That is,  $(1-\tau)[f(n) - wn]$ , evaluated at  $w^*$ , is smaller in value than when it is evaluated at  $w$ ; hence  $(1-\tau)[f(n^*) - w^*n^*] < (1-\tau)[f(n) - wn]$  and  $\pi^*_{\max} < \pi_{\max}$ . The same result holds with competitive labor market as can be seen by comparing  $\pi^*_{\max}$  and  $\pi_{\max}$  at the same wage rate,  $w = w^* > \bar{w}$ .

that  $f_n > \bar{w} \frac{1+\theta(1-\tau)}{\theta(1-\tau)}$ , it is profitable for the enterprise to pay a wage exceeding the minimum and bear the burden of EWT. It follows that the more productive enterprises are the ones to pay wages exceeding the minimum wage under EWT.

To recapitulate, the incidence of EWT is both on labor and the enterprise; with EWT, wage and profit are lower than they would be without EWT.

If the enterprise profit is totally or partially transferred to the government, then the government revenue also suffers from the decline in profits resulting from the imposition of EWT, which may or may not be wholly compensated by EWT revenue, because tax revenue with EWT is not necessarily greater than revenue without EWT. Tax revenue collected from the enterprise without and with EWT can be expressed as, respectively,

$$T = \tau[f(n) - wn] \quad (20)$$

$$\begin{aligned} T^* &= \tau[f(n^*) - w^*n^*] + \tau(w^* - \bar{w})n^* \\ &= \tau[f(n^*) - \bar{w}n^*] \end{aligned} \quad (21)$$

Comparison of (20) and (21) shows that  $T^* \geq T$  if

$$[f(n^*) - \bar{w}n^*] \geq [f(n) - wn] \quad (22)$$

Since the condition in (22) need not hold in general, the imposition of EWT may well result in a net loss of tax revenue to the government. This is because even though the statutory tax base with EWT is broader, taxable profit is lower. <sup>1/</sup>

### 3. The incentive to avoid EWT

The enterprise may have the leeway to remunerate workers in ways that do not trigger EWT (see the Russian example below). For example, certain types of bonuses or overtime pay may not be included in the statutory EWT base and the excess of the wage bill over the hypothetical wage bill for EWT purposes may thus be lowered. Let us assume that all payments in excess of the minimum wage may be deducted as cost under the corporate income tax but only  $0 < \beta < 1$  portion of such payments is entered in the EWT base. Under

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<sup>1/</sup> As shown above, the effectiveness of EWT depends on  $f_n$  and  $\theta$ . Given those parameters, if EWT is effective then  $w^*$  does not exceed the minimum wage by a wide margin; then, as indicated by (21), EWT revenue is lower. Therefore, it may be argued that the more effective EWT the lower the revenue from EWT.



these assumptions, the enterprise profit under EWT, denoted as  $\pi^*(\beta)$ , can be expressed as

$$\begin{aligned}\pi^*(\beta) &= (1-\tau)f(n) - (1-\tau)(\bar{w} + b^*)n - \tau(\bar{w} + \beta b^* - \bar{w})n \\ &= (1-\tau)[f(n) - \bar{w}n] - [(1-\tau) + \tau\beta]b^*n\end{aligned}\quad (23)$$

If  $\beta = 0$ , all EWT liability is avoided; if  $\beta = 1$ , the EWT liability is paid in full. From (23), it can be shown that

$$\frac{\partial \pi^*(\beta)}{\partial \beta} < 0 \quad (24)$$

for any  $b^* > 0$ . Therefore, the greater the leeway to avoid EWT, the higher the profit and  $w^*$ ; hence both the enterprise and the workers have an incentive to collude in order to avoid EWT.

#### 4. The incidence of EWT with two types of labor

Now suppose that the enterprise employs two types of labor, skilled and unskilled, denoted respectively by  $n_1$  and  $n_2$ . Further assume that  $n_2$  is paid the minimum wage whereas  $n_1$  may be paid a wage,  $w_1$ , exceeding the minimum wage, that is, the enterprise takes  $\bar{w}$  as given and chooses the level of  $w_1$  and  $n_2$ . Then, from (3), the enterprise profit without EWT is

$$\pi = (1-\tau)[f(n_1, n_2) - (w_1 n_1 + \bar{w} n_2)] \quad (25)$$

Maximizing (25) with respect to  $w_1$  and  $n_2$ , we obtain

$$w_1 = \frac{\theta_1}{1+\theta_1} f_1, \quad b_1 = \frac{\theta_1}{1+\theta_1} f_1 - \bar{w}; \quad (26)$$

$$f_2 = \bar{w}, \quad b_2 = 0$$

where  $f_1$  and  $f_2$  refer respectively to the marginal product of  $n_1$  and  $n_2$  and  $b_1$  and  $b_2$  to the increments exceeding the minimum wage paid to  $n_1$  and  $n_2$ , and  $\theta_1$  refers to the elasticity of supply of  $n_1$ .

However, with EWT, and  $\alpha = 1$  as before, the enterprise profit from (6) is

$$\pi^* = (1-\tau)f(n_1, n_2) - (w_1 - \tau\bar{w})n_1 - (1-\tau)\bar{w}n_2 \quad (27)$$

Maximization of (27) yields

$$w^*1 = \frac{\theta_1}{1+\theta_1} [(1-\tau)f_1 + r\bar{w}] ,$$

$$b^*1 = \frac{\theta_1}{1+\theta_1} (1-\tau)f_1 - \frac{\bar{w}}{1+\theta_1} [1+\theta_1(1-\tau)] ;$$

$$f_2 = \bar{w} , b^*2 = 0$$
(28)

Under the assumption that  $\theta_1$  is constant, it is shown in appendix I that

$$w^*1 < w_1 , n^*1 < n_1$$
(29)

that is, the wage and employment levels of skilled labor with EWT are lower than they would be without EWT. If the two types of labor are complementary ( $f_{12} > 0$ ), this result implies that the level of employment of  $n_2$  is lower with EWT than it would be without EWT, therefore, output with EWT also is lower. Along with the results obtained in Section II.2, it can also be shown that the enterprise profit is lower, hence the incidence of EWT is both on the (skilled and unskilled) workers and the enterprise. Thus, if the skilled workers can be viewed as the managers, the managers also bear the burden of EWT along with the unskilled workers. Finally, the impact of EWT on tax revenue remains ambiguous as before.

##### 5. The impact of EWT on inflation

The discussion in this section will be restricted to the homogeneous labor case discussed in Sections II.1 and II.2 where the analysis has been conducted under the assumption of constant prices. The same results hold with perfectly anticipated inflation since, given the inflation rate and the real minimum wage, the profit maximizing enterprise will adjust the nominal wage such that (13) and (14) hold. It is shown in appendix II that, in the absence of EWT, adjustment of the minimum wage with respect to inflation does not affect the equilibrium because  $\partial w/\partial \bar{w} = 0$ ; however, the government's minimum wage policy with respect to inflation affects the wage level under EWT because

$$(\partial w^*/\partial \bar{w}) > 0$$
(30)

This result is due to the fact that when  $\bar{w}$  is increased the EWT base declines for any  $w^* > \bar{w}$  and the tax penalty for paying a wage exceeding the minimum wage is diminished at the margin. The result in (30) implies that, with EWT, the government has the leeway to lower the wage award granted by the enterprise by means of lowering the minimum wage. In an inflationary environment, this policy would amount to adjusting the nominal minimum wage,  $\bar{W}$ , at a rate less than the rate of inflation which would result in a lower real minimum wage and therefore a lower real wage paid by the

enterprise exceeding the real minimum wage. 1/ Therefore, even though EWT affords the government the facility to lower the wage award granted by the enterprise in the face of inflation, this happens at the cost of lower output since in this model lower  $w^*$  implies a lower level of employment. 2/

Against the background provided by the foregoing observations, the relevant question is, can EWT result in a lower rate of inflation given the rate of increase in money supply? The following heuristic arguments indicate that the answer is negative. 3/ For simplicity, let us assume that all the enterprises in the economy are identical so that aggregate output of the economy,  $Y$ , is the sum of the outputs of  $z$  individual firms. Let us further suppose that capital stock is constant and the trend growth rate of the economy is zero. Then, the relationship in (30) indicates that aggregate output can be expressed as a function of the minimum wage as

$$Y = zf\{n[w(\bar{w})]\} = zh(\bar{w}) ; \quad (31)$$

$$\partial Y / \partial \bar{w} = z(\partial h / \partial \bar{w}) > 0$$

At a point in time, suppose the equilibrium in the economy is determined by the Quantity Equation,  $MV = PY$ , where  $V$  is velocity, which is assumed to be constant,  $M$  is the money stock, and  $P$  is the price level. 4/ Substituting (31) into the Quantity Equation, we obtain

$$P = VM/Y = \left(\frac{VM}{z}\right) [1/h(\bar{w})] \quad (32)$$

$$\partial P / \partial \bar{w} < 0$$

First, let us assume that  $M$  is constant. Given the minimum wage, when EWT is imposed, then the equilibrium real wage and aggregate employment

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1/ The opposite results would hold if the rate of increase in the nominal minimum wage exceeded the rate of inflation. Here, we focus on the policy aim of containing "excessive" wage awards by the enterprise in the face of inflation.

2/ Similar arguments are valid in the case of the competitive labor market. As shown in Section I.1.a, in that case, although EWT does not affect the wage level, it affects the firms's output-employment level. Thus, if the minimum wage declines, then, as indicated by (10), marginal cost rises, which implies a lower aggregate output-employment level.

3/ We define a formal analysis of inflationary adjustment over time in response to the government's minimum wage policy under EWT as outside the scope of this paper.

4/ Thus,  $Y = V(M/P)$  is assumed to represent the aggregate demand function.

level decline ( $w^* < w$ ,  $z_n^* < z_n$ ) and therefore aggregate output declines ( $Y^* < Y$ ). It follows that, given  $M$ , the price level jumps. <sup>1/</sup>

Price dynamics under EWT can be evaluated by taking the logarithm of (32) and differentiating with respect to time. Thus, it can be shown that the dynamic relationship between the price level and the minimum wage is

$$\rho = \mu - \epsilon\omega ; \tag{33}$$

$$\rho = \frac{1}{P} \frac{dP}{dt} ; \mu = \frac{1}{M} \frac{dM}{dt} ; \omega = (1/\bar{w}) \frac{d\bar{w}}{dt} ; \epsilon = [\bar{w}/h(\bar{w})] (\partial h/\partial \bar{w}) > 0$$

Of course, (33) does not represent a steady-state equilibrium since the minimum wage cannot decrease or increase indefinitely. However, it is possible to imagine that, for a period of time, the inflation adjustment in the minimum wage is such that the government allows the minimum wage to decrease (see the case of Poland below) or increase. As long as the minimum wage is adjusted with respect to inflation ( $\omega = 0$ ), the inflation rate is equal to the rate of money creation and (33) describes a steady-state equilibrium. If the minimum wage is allowed to decrease over a period ( $\omega < 0$ ), then output declines and the inflation rate exceeds the rate of money creation ( $\rho > \mu$ ). The reverse arguments hold if the minimum wage is adjusted such that for a period of time it increases and output rises and inflation rate declines.

The foregoing arguments indicate that, although instrumental in curbing the wage award by the enterprise in the face of inflation, depending on the government's minimum wage policy, EWT can actually be pro-inflationary and even result in stagflation.

### III. The Labor-Dominated Enterprise

#### 1. Homogeneous labor

Throughout Section II we assumed that the enterprise's objective was profit maximization. However, this assumption may not be representative of the behavior of the state-owned enterprises. Such enterprises are often controlled by labor unions or, at least, unions exert decisive influence on

<sup>1/</sup> For the stability of the new path of the price level, we may assume that at the time when the price level jumps upward, the government adjusts the nominal minimum wage so as to keep the real minimum wage at its initial level. The lack of such adjustment, as it is likely to present itself in reality, implies interesting inflationary dynamics under EWT. If the nominal minimum wage is not adjusted in response to the jump in the price level, then the real minimum wage declines which sets in motion a further decline in the equilibrium real wage, hence a decline in output, hence a further jump in the price level.

management decisions.<sup>1/</sup> Therefore, alternatively, we may conjecture that the enterprise's objective is to maximize its workers' income subject to a profit constraint as determined by the government which owns the enterprise. In other words, we assume that the enterprise is under obligation to pay tax out of its gross profit and transfer a fixed net profit to the government. The profit constraint set by the government essentially corresponds to the extent to which the government is willing to support the enterprise. For example, if the profit target is set at a negative level, this would imply that the government is subsidizing the enterprise. Such a subsidy would likely be in the form of easy credit extended to the enterprise either directly by the government or through the state-controlled banking system. In this sense, the profit target can be interpreted as the parameter that establishes the extent to which the government is willing to impose a hard budget constraint on the enterprise.

As regards the wage and employment policy of the labor-dominated enterprise, two simple cases are considered. In the first case, we assume that the enterprise takes the present level of employment as given and does not lay off workers and, at the same time, the workers supply labor inelastically; that is, the number of workers employed by the enterprise is given. This conjecture appears to be roughly representative of the employment policy of the state-owned enterprises in the FSU which are either unable to or unwilling to effect lay-offs and alternative employment opportunities for the workers of the enterprise are very limited. In the second case, we assume that the enterprise has the leeway to set the wage level and, as the wage level is adjusted, the workers either choose to work fewer (more) hours or some workers choose to quit (enter) the work force. The second conjecture is given impetus by the presence of early retirement options, retraining possibilities, unemployment and welfare benefits. <sup>2/</sup> The decline in labor supply can also be interpreted as a decline in work effort, and conversely. We maintain the assumption that labor supply is less than perfectly elastic, as assumed in Section II.

In the first case, suppose the government sets the profit target at  $\pi^g$ , a constant. Then, without EWT, from (7),  $w$  can be expressed as and, with EWT, from (8),  $w^*$  can be expressed as

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<sup>1/</sup> In this paper, we do not attempt to provide a comparative analysis of the effects of EWT on the competitive enterprise versus the labor-dominated enterprise and limit the analysis in this section to the impact of EWT on the labor-dominated enterprise. Nevertheless, such a comparative analysis would be illuminating in explaining the aggregate wage and employment behavior in the former socialist countries during structural transition from a system characterized by labor-dominated enterprises to a system characterized by competitive privatized enterprises; a study related to this issue is by Stewart (1984).

<sup>2/</sup> In the FSU, the common practice for the enterprises is to make significant contributions toward such benefits.

$$\begin{aligned}
 w &= \frac{f(n)}{n} - \frac{\pi^g}{(1-\tau)n} \\
 &= \bar{w} + \frac{(1-\tau)[f(n) - \bar{w}n] - \pi^g}{(1-\tau)n}
 \end{aligned}
 \tag{34}$$

$$\begin{aligned}
 w^* &= \frac{(1-\tau)f(n)}{n} + \tau\bar{w} - \frac{\pi^g}{n} \\
 &= \bar{w} + \frac{(1-\tau)[f(n) - \bar{w}n] - \pi^g}{n}
 \end{aligned}
 \tag{35}$$

Comparison of (34) and (35) (given the same  $n$ ,  $\bar{w}$ ,  $\pi^g$ , and  $\tau$ ) shows that

$$w^* < w \tag{36}$$

that is, EWT serves to lower the wage level. 1/ This result obtains for the simple reason that the government increases the tax base without lowering its profit share and the additional tax is paid by the workers. 2/ In either case, the government has the leeway to choose  $\pi^g$  such that  $w = \bar{w}$  or  $w^* = \bar{w}$ , therefore, the effect of EWT on wages is moot. Further, it is clear that the lower the profit target set by the government, the higher the wage with or without EWT. It is therefore in the interest of the workers to understate the profit of the enterprise to increase their wages. This opens the possibility of a wage bargain between the enterprise and the government in the process of deciding the level of  $\pi^g$ . If the government does not have the capacity to monitor the enterprise profits adequately and may therefore be inclined to settle for a lower profit transfer than targeted (or if the government lacks the political will to lower subsidies to the enterprise), the enterprise may attempt to "negotiate" a lower profit transfer (or a higher subsidy level) to maximize the workers' wages. 3/ While the effect of EWT in this case is moot, it nevertheless affords the government an additional bargaining chip; for example, with EWT, the government might settle for a lower  $\pi^g$  than it would without EWT and attempt to make up the difference indirectly with additional revenue from EWT.

1/ We can show that  $w^* < w$  if  $\pi^g < (1-\tau)[f(n) - \bar{w}n]$  which holds if  $w$  and  $w^*$  are both greater than  $\bar{w}$  as assumed.

2/ In this case, since output level is not affected by EWT and  $\tau$  is given, the increase in the tax base would unambiguously lead to an increase in tax revenue with EWT. To the extent the increase in revenue results in a lower recourse to inflationary finance, the rate of money creation may decline hence the inflation rate may decline.

3/ This phenomenon has been observed in most transition economies.

In the second case, the enterprise maximizes the workers' income ( $w_n$  without EWT or  $w^*n^*$  with EWT) by choosing the wage level. Elastic labor supply implies that the level set for  $\pi^g$  by the government cannot exceed the maximum profit levels implied by the maximization of (7) and (8), that is,  $\pi_{\max}$  without EWT, and  $\pi^*_{\max}$  with EWT. If the government chose  $\pi^g = \pi_{\max}$  without EWT or  $\pi^g = \pi^*_{\max}$  with EWT, the enterprise would choose  $w$  and  $w^*$  exactly at the levels found in Section II.1.b; therefore,  $w^* < w$  hence  $w^*n^* < wn$ . If the government chose  $\pi^g < \pi_{\max}$  or  $\pi^g < \pi^*_{\max}$ , then  $w$  and  $w^*$  would be higher than before with  $w^* < w$ ; hence the workers' income would also be higher. However, if the government chose  $\pi^g > \pi_{\max}$  or  $\pi^g > \pi^*_{\max}$ , then the enterprise would be unable to achieve the profit target set by the government. 1/ Therefore, in this case also, the effect of EWT on the wage level is moot and the wage, output and employment levels depend on the profit target (or the subsidy level) chosen by the government.

## 2. Self-seeking managers

The model in Section III.1 can be extended to the heterogenous labor case to shed light on the behavior of self-seeking SOE managers. It has been argued that EWT provides an incentive to managers to avoid the tax by averaging in a few high salaries--those of the managers-- with many low salaries --those of the workers. Let us assume that the enterprise now employs two types of labor, skilled labor or the managers,  $n_1$ , and unskilled labor or the workers,  $n_2$ . Then, the managers' wages without and with EWT,  $w_1$  and  $w^*_1$  can be expressed as, respectively,

$$w_1 = \frac{f(n_1, n_2)}{n_1} - \frac{w_2 n_2}{n_1} - \frac{\pi^g}{(1-\tau)n_1} \quad (37)$$

$$w^*_1 = (1-\tau) \frac{f(n_1, n_2)}{n_1} - \frac{(w_2 - \tau \bar{w})n_2}{n_1} + \tau \bar{w} - \frac{\pi^g}{n_1} \quad (38)$$

where  $\pi^g$  is the profit level required by the government. Suppose that,  $n_1$  is given, that is, the managers are ensconced in their positions and have the collective power to maximize their wages,  $w_1$  or  $w^*_1$ , by choosing the level of  $w_2$ .

If labor shedding is not possible, that is, if the level of  $n_2$  is given, then it is clear from (37) and (38) that the managers will prefer to pay as small a wage as possible to the workers, which is the minimum wage. 2/ Perhaps in this sense, it would be possible to argue that EWT would result in a few managers surrounding themselves with many low-wage

1/ Arguably, the government is not likely to have enough information to choose  $\pi^g = \pi_{\max}$  or  $\pi^g = \pi^*_{\max}$ , therefore, similar to the first case discussed above, the enterprise has the leeway to negotiate the level of profit transfer to the government.

2/ Both  $\partial w_1 / \partial w_2$  and  $\partial w^*_1 / \partial w_2$  are negative.

workers in order to avoid the tax. In this case, by substituting  $\bar{w}$  for  $w_2$  in (37) and (38), it is possible to show that

$$\bar{w} < w_1^* < w_1$$

if

(39)

$$\pi \mathcal{E} < (1-\tau)[f(n_1, n_2) - \bar{w}n_1 - \bar{w}n_2]$$

that is, for the same  $\pi \mathcal{E}$ , EWT lowers the managers' wages. However, the impact of EWT on the managers' wages is moot because the government has the leeway to choose  $\pi \mathcal{E}$  such that the managers' wage obtains at a desired level ( $w_1, w_1^* \geq \bar{w}$ ).

If labor shedding is possible, then the managers can choose the level of  $w_2$ . Assuming, as before, that the supply elasticity of  $n_2$ ,  $\theta_2$ , is between zero and infinity, maximization of (37) and (38) with respect to  $w_2$  yields, respectively,

$$w_2 = \frac{\theta_2}{1+\theta_2} f_2$$
(40)

$$w_2^* = \frac{\theta_2}{1+\theta_2} [(1-\tau)f_2 + r\bar{w}]$$
(41)

Along the lines of the arguments leading to the result in (18) in the case of the profit-maximizing enterprise, it can be shown from (40) and (41) that

$$w_2^* < w_2 ; n_2^* < n_2$$
(42)

This result holds because now the managers are behaving as "profit" maximizers by maximizing their wage and they pay the workers lower wages because with EWT the marginal cost of  $n_2$  is higher. So, when labor shedding is possible, the analysis indicates that self-seeking managers would shed labor to maximize their own income. In this case, we can also show that  $w_1^* < w_1$ . 1/ However, again, the impact of EWT on the managers' wages is moot since the level of such wages can be manipulated by the government through choosing the level of  $\pi \mathcal{E}$ . 2/ In practice, management and workers are likely to connive to subvert the EWT (see the Russian example below).

1/ See appendix III. Akin to the result in the case of profit maximizing enterprise in (19), the "profit" or the rent reaped by the managers through maximizing their own wages is lower with EWT.

2/ In this case, since  $n_1$  is constant, lower  $n_2$  would generally imply a lower output level, therefore, given constant money supply and velocity, price level would jump when EWT is imposed.



Whether or not labor shedding is possible, the incidence of EWT is unambiguously both on the workers and the managers. The government has the leeway to choose the level of  $\pi^E$  in order to control the managers' wages; the lower  $\pi^E$  the higher is the managers' wages. Hence the managers have an incentive to conceal the level of profits and "bargain" for lower profit targets or higher subsidies. Therefore, the relevant question is one of fiscal discipline or the "hardness" of the budget constraint imposed on the enterprise by the government as the ultimate owner of the enterprise.

Another related issue concerns possible preventive impact of EWT on malfeasance by the managers in stripping the assets of the enterprise. Asset stripping can be accomplished by means of excess wage payments during the course of privatization when property rights are rather ambiguous. One possibility is that the managers foresee that the government cannot or will not subsidize the enterprise indefinitely (that is, the government will not settle for low or negative levels of  $\pi^E$ ). Then, an option may be to gradually sell the enterprise assets and pay the proceeds to the workers (or at least to the favored workers) in the form of excessive wages. <sup>1/</sup> Since EWT discourages wage payments in excess of the norm, it may be instrumental in preventing asset stripping by the managers. For the managers to prefer a bankruptcy bonanza, they would have to figure that the present value of the proceeds in the process of bankruptcy (plus the present value of the wages they expect to make from alternative employment) is somehow larger than the present value of the wages they expect to make in their current positions if they did not bankrupt the enterprise. The present value calculations may well favor bankruptcy and, in some fashion, the managers can become "corporate raiders". However, this does not appear feasible or realistic in the context of the transition economies because, first, by and large, the market institutions and political will to facilitate bankruptcy of SOEs do not exist; second, the process is too conspicuous; and third, alternative employment opportunities of an overwhelming majority of workers, including the managers, may be limited. Therefore, the preventive impact of EWT on asset stripping appears to be at best marginal (see the evidence and discussion below on the experience of Poland).

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<sup>1/</sup> This point invokes a question which is similar to the familiar one that may be posed in market economies: would the tax authority allow the enterprise to declare losses by making excessive wage payments to the managers or to shareholders who are disguised as workers? At least in the case of the United States, the Internal Revenue Service's answer is patently no. In the case of FSU and Eastern European countries, the existing EWT legislation does not address the question.

#### IV. Experience with EWT in FSU and Eastern Europe

##### 1. Poland

The experience of Poland is a good example and the most recently documented. To contain the growth of wages, a tax on "inflationary" or "excessive" wage growth was in force until the end of 1988. <sup>1/</sup> This was levied on the profit of enterprises in which the total wage bill exceeded a certain norm. The tax equalled 100 to 500 percent of the excess over the permitted growth of wages, and 200 to 400 percent for awards and premia paid from after-tax profits. In 1989, this tax was abolished in favor of a regulation that wages exceeding a ceiling fixed by the Council of Ministers by executive order were subject to an "income tax increased by 200 percent" (Fiszler (1991)). In January 1990 a new law was introduced. Excessive wage growth was taxed at progressive rates from 200 to 500 percent, while above-ceiling premia paid out of after-tax profits were taxed at 500 percent. In January 1991, another new law on taxing inflationary wage growth was introduced. The principles were similar to the law that existed before 1989, with the difference that tax payments were tied to progress on privatization, and that the average wage rather than the total wage bill was made the reference point.

The law only applied to state-owned enterprises. The excess of the average wage of a state enterprise in any month over a norm set by the Council of Ministers with reference to the development of average wages in the economy, was subjected to a progressive tax with rates between 100 percent (for exceeding the norm by up to 3 percent) and 500 percent (for exceeding the norm by more than 5 percent). On the face of it, this system was quite restrictive as the inflation indexation coefficient on the norm was 0.6 during 1991-92. In fact, however, the policy was not particularly restrictive as the actual implementation of the EWT allowed for special exemptions, adjustments, and nonindexed linked modifications to the norm. This, together with the apparent willingness of many enterprises to pay the tax, led to significant increases in nominal wages. For example in 1990, the average wage typically exceeded the norm, particularly towards the end of the year.<sup>2/</sup>

Although EWT revenue represented some 1.5 percent of GDP in 1992, state enterprises accumulated large EWT arrears. In 1991 accrued EWT liabilities amounted to Zl 39 trillion, but actual collections amounted to only Zl 27 trillion; about 50 percent of all outstanding tax arrears were EWT arrears. It was clear that some large state owned enterprises simply refused to pay

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<sup>1/</sup> This went by the delightful name of the "POPIWEK" or PPWW.

<sup>2/</sup> In 1990, the excess of actual wages above the norm toward the end of the year has been partly attributed to consuming the unutilized margin between the actual wages and the norm from the first half of the year, which could be carried out without triggering PPWW; see Pinto (1992b), p.107, and, Figures 2-6, pp. 118-122.

the full EWT due. The arrears were concentrated in a few large state enterprises, such as the State Railroad Company (PKP) and the State Airlines (LOT), which, incidentally, were the same companies that also received large amounts of subsidies. By the end of 1993, "Popiwiek" arrears amounted to over one percent of GDP (Schwartz, 1994, p. 9).

As regards the incidence of PPWW in Poland, evidence provided by Pinto (1992a) is illustrative. Three sets of SOEs during January to June 1992 have been analyzed: those having a positive net profit; those with a positive gross profit but negative net profit; and those with a negative net profit. Table 2 shows that tax arrears as a percentage of taxes due have been most substantial and have grown fastest for those firms that are the least profitable.

Table 2. Tax Arrears Relative to Taxes Due

(In percent)

Profits	1990	1991	1992 <sup>1/</sup>
Positive net	1.8	3.3	3.7
Positive gross, negative net	0.2	17.4	26.8
Negative net	5.0	42.7	50.8

<sup>1/</sup> First six months.

Further, Table 3 shows that average wages were larger and increased faster in the more profitable firms.

Table 3. Average Wages for Selected Months

(Thousands of zlotys per worker)

Profits	Dec. 1989	June 1980	Dec. 1990	June 1991	Dec. 1991	June 1991
Positive net	658	918	1,568	1,573	2,178	2,169
Positive gross, negative net	765	1,014	1,763	1,334	1,885	2,017
Negative net	603	852	1,395	1,440	1,737	1,858

The PPWW per worker accrued (but not necessarily paid--see Table 2) shown in Table 4 suggests that the most profitable firms have paid the highest excess

wage taxes. This is consistent with the earlier analysis (Section II.2) and indicates that EWT penalizes the more productive enterprises and that EWT in Poland did not prevent the profitable companies from paying wages exceeding the norm. EWT's cost was borne by successful SOEs while those with lower average wage payments and decapitalization coped with their PPWW liabilities by running up arrears.

Table 4. PPWW per Worker

(Thousands of zlotys)

Profits	1990	1991	1992 <sub>1/</sub>
Positive net	3,665	6,500	1,635
Positive gross, negative net	5,675	4,740	219
Negative net	1,319	1,518	256

<sub>1/</sub> First six months.

Further evidence suggests there is no direct connection between PPWW liability and running down the capital stock of a company. Although the least profitable firms were running down their capital, this could not be ascribed to PPWW payments, as the most profitable firms had the highest PPWW liabilities and almost zero arrears.

There is also evidence that, as predicted by our model, real wages and employment (although no doubt influenced by many more prominent factors such as credit and interest rate policies) declined after PPWW was introduced, especially in the high-productivity industries.<sub>1/</sub>

In view of the decline in the wage norm, our model would also predict a decline in output-employment level and hence a rise in the inflation rate, given the rate of money creation. However, the evidence on the impact of EWT on inflation is inconclusive. Pinto (1992b) argues that the effectiveness of the wage policies under EWT in controlling inflation is suspect. In contrast, Blanchard and Layard (1992) argue that, in the

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<sub>1/</sub> For evidence on wage and output-employment developments in 1990, see Pinto (1992b) in Coricelli and Revenga (1992); the inflation adjustment of the wage norm (minimum wage in our model) being only partial (the inflation adjustment coefficient was typically less than unity), from December 1990 to March 1991, the real wage norm and actual real wages declined (Table 4, p.107). For further evidence on the negative impact of PPWW on wages, see Pinto and van Wijnbergen (1994).

absence of the incomes policy effected through EWT, there would be an increase in the inflation rate.

A disadvantage of the Polish EWT has been the tendency of the government to fine tune the PPWW by introducing narrow exemptions from EWT. A 100 percent exporter can be exempted from PPWW; this led, for instance, to a rush to export semi-processed steel, cutting domestic supplies and also hurting finished steel producers. Again, in 1993 enterprises were allowed to negotiate exemptions with local tax chambers for exemption from the PPWW in light of their individual wages policies. An overwhelming criticism of the PPWW was the relative and partial way it was administered. Numerous examples of discrimination could be cited. 1/ SOE managers had a strong preference (59 out of 63 sampled) for a wage bill formula rather than the average wage norm. If the PPWW was to be retained, managers wanted uniform enforcement, no forgiveness for arrears, and no exceptions. Managers proposed that PPWW should be simplified and a maximum rate of 100 percent should be used. On this issue, the IBRD study concludes: *"A more positive way of inducing firms to focus on profits and long-run health is to simplify the PPWW ... and link managerial compensation to profits, at the same time clarifying the position and rewards for management following privatization so that the maximization of the firms' value becomes paramount"* (Pinto (1992a), p. 29). Of course, this begs the question of why, if managers are to be driven by a focus on profits, they should need any artificial excess tax on wages. Presumably, given a credible timetable for privatization, the SOEs will pay those wages that will maximize profits in the medium term?

It has been proposed to move away from the PPWW system in 1994 to a form of trilateral wage bargaining (government, workers, employers). 2/ Given the long history of such arrangements (for example, the Netherlands in the 1950s and 1960s), this may be wishful thinking as a solution to wage-cost control. A better solution would be to face up to the lack of financial discipline in some fifty SOE's and impose stringent financial controls, including the potential for ultimate bankruptcy.

## 2. Azerbaijan

As shown in Table 1, the Azerbaijan EWT norm is four times the minimum wage and levied at the corporate profit tax rate of 35 percent. Because the corporate tax rate structure is progressive in Azerbaijan, the marginal rate at which excess wages can be taxed can be as high as 70 percent. So the rate at which EWT is levied varies not only according to the size of the wage bill, but also according to the size of profits and hence is further

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1/ A shipyard paying about 30 percent above the average wage, in arrears on PPWW, received a one-third reduction of debts (including accounts payable). Mining companies also were exempted.

2/ In fact, further shuffling to and fro occurred. The "Popiwiek" lapsed as of March 31, 1994 but a further revised version re-emerged in August 1, 1994 (Schwartz, 1994, p. 21).

distorted between different enterprises at different times. It was reckoned that about a quarter of the profits tax revenue was attributable to EWT (some 3 to 4 billion rubles in 1992). Arguably, an EWT that generates substantial revenue is not working well to discourage wage awards. The reasons for this apparent failure in Azerbaijan are threefold. First, SOEs in a monopoly position regard EWT as a cost and pass it forward in price increases. Second, lack of financial discipline and generous credit expansion allow full pass-through of costs. Finally, rapidly accelerating inflation means that calculations based on a minimum wage that is quickly out of date are mostly irrelevant to the wages paid to skilled workers.

### 3. Belarus

In Belarus, both SOE managers and the government viewed EWT as a badly focussed tax, that is, distortionary, widely evaded, and difficult to administer fairly. The most potent criticism of EWT in Belarus is that the authorities abolished the tax in late 1992. This reflects a widespread view of EWT in countries that have had to use them for many years (Hungary).

### 4. Bulgaria

The 1994 table for the rates of EWT below is a good illustration of how the tax operates.

Table 5. Bulgaria: EWT

Percentage Increment of Wage Funds Compared to the Basic Reference Amount	Tax Rate Depending on the Average Monthly Gross Wage for the Respective Quarter of 1994 (in percent)			
	Up to 2 Minimal wages	Up to 3 Minimal wages	Up to 4 Minimal wages	More than 4 Minimal wages
Up to 2	--	--	--	--
More than 2 up to 3	10	50	75	100
More than 3 up to 4	20	75	100	200
More than 4 up to 5	50	100	200	600
More than 5	100	200	600	800

Note: Tax rates are distributed in four groups (columns) depending on the minimal wage established in the country for the respective quarter or 1994.

The regulations under the Bulgarian EWT (appendix IV) show that this is no simple tax to administer, suggesting that compliance costs must be considerable. Under Article 3 of the regulations, there are six ways of establishing the basic reference amount of the wages depending on whether the volume of sales has increased or decreased, whether debts and arrears have changed, and a choice of appropriate coefficients.

In contrast to Azerbaijan, if low revenue indicates EWT is working to restrain wage awards, then Bulgaria has a success story on its hands. In 1991 the revenue collected from EWT was equal to about 0.4 percent of GDP, equivalent to about 5 percent of the revenues from social security contributions; the figures were similar for 1992. However, perhaps the greater competition and better credit control explains more of the wage restraint than the impact of EWT.

#### 5. Estonia

The intent of the Estonian EWT is to allow real wages to be maintained but to penalize any increase above the expected inflation guidelines. Average employee compensation is defined as gross incomes per employee. Gross incomes includes salaries, premia, cash and in-kind support, interest subsidies, distributed profits and incomes from company shares. Revenue has been negligible. Once again, the Estonian economy has been more open to competition and wages appear to have been restrained not so much by EWT as by the extremely tight credit availability enforced through the Estonian Currency Board.

#### 6. Hungary

Hungary has a long history of using EWT, based on both the wages bill and the average wage.<sup>1/</sup> Again, like Belarus, the most convincing commentary may be that the government abolished EWT as of January 1992. The tax was more sophisticated than in many countries including allowances for performance indicators limiting the permissible wage increase to gross value added and profitability. Separate schemes, at times, allowed for wage increases for enterprises subject to competitive pricing rules and for agriculture. Most recently, wage increases exceeding the increase in the value-added of the firm were not treated as costs and were taxed at the corporate rate. Boote and Somogyi argue that "*wage regulation schemes largely prevented sizable wage overruns associated with loose financial discipline*" (pp. 18-19). Increasing competition from the private sector (not liable to EWT) required the SOEs to pay wages differentiated according to productivity and efficiency; the EWT had become a constraint on remodelling the public sector industries. Moreover, it was clear that the administration of this tax was difficult and it was resented by managers, especially *thrusting and modernizing managers*. Increasingly, the EWT had become irrelevant in containing wage growth in public enterprises.

#### 7. Kazakhstan

Parliament rejected the EWT sought by the administration in May 1992. They did so for at least three reasons: widespread recognition that other countries experience with EWT had been disappointing; intensive lobbying by

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<sup>1/</sup> See Boote and Somogyi (1991), Section VI.

enterprises against the new tax; and, strong doubts about the ability of the tax administration to apply and monitor EWT.

8. Kyrgyzstan

If small revenues are to be a measure of EWT's success, the Kyrgyzstan tax is working well. In 1991 it is reckoned that revenue from EWT was about 1.7 percent of total revenue from the enterprise profits tax. Of course, this could also be an indication that the tax administration was simply failing to assess and collect the tax.

9. Latvia

The revenue from EWT in 1992 seems to have been small (0.4 percent of total central government revenue). The success in controlling wage increases is probably due more to a tight monetary policy and to extremely depressed demand. Most recently, the authorities introduced an amendment so that increases in productivity (defined as the change in real output divided by the change in employment) would not be subject to EWT. It was also suspected that if trade started to expand, firms would start to evade EWT.

10. Russia

The Russian authorities agree that EWT's objective is not to raise revenue but to encourage enterprises to use profits for investment rather than excessive wage payments. <sup>1/</sup> The enterprises' profits tax for the quarter is paid in advance. In principle the enterprise should incorporate an estimate of its excess wages tax to be taxed under the enterprise profits tax. It is unclear whether this is, in fact, calculated. However, in the month following each quarter the enterprise profits tax and EWT is computed based on actual profits, wages, and the norm for the previous quarter. An immediate settlement is made by the enterprise. It is thought that EWT is less than it might be as enterprises increase nonwage compensation to labor in the form of payments to pensions funds, vacation funds and other employer-provided benefits.

V. Summary and Conclusions

In the case of the profit maximizing enterprise, the main conclusion of our model is that, even though EWT has the potential to curb wage awards, this is achieved at the cost of a decline in the output and employment level. In the extreme cases of perfectly elastic or perfectly inelastic

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<sup>1/</sup> This exemplifies a problem in many reforming socialist economies regarding the ownership of capital. Since capital used to be allocated through the plan, enterprise managers had little obligation or incentive to pay a return on capital; instead managers paid as much of enterprise revenue as they could in wages or in other forms of compensation to labor.



labor supply, EWT amounts to a wage floor. The effect of EWT on total tax (standard corporate income tax plus EWT) paid by the enterprise is ambiguous. Moreover, depending on the degree of inflation adjustment of the minimum wage or the wage norm effected by the government, EWT may well be pro-inflationary and even result in stagflation. In the case of the labor-dominated enterprise seeking to maximize the workers' or the managers' income, the impact of EWT on the enterprise behavior is moot. At best, EWT might serve as an indirect bargaining chip for the government in the process of guiding the wage award to be made by the enterprise. Further, EWT does not appear to have a significant effect on asset-stripping. As the revenue potential of EWT appears weak, the conventional taxes are likely to perform much better in generating additional revenue. The foregoing observations indicate that, if effective to a significant degree, EWT is likely to have deleterious consequences for enterprise efficiency and for output and inflation levels.

Have the recent EWTs modified wage claims or SOE behavior to restrain inflation? Those countries where the revenue from the tax has been low (Bulgaria, Estonia, Kyrgyzstan, and Latvia) ascribe the moderation of wage increases not to EWT but to tighter control over credit and to an inability to pass forward cost increases owing to depressed demand. Where SOE managers are not subject to tight credit control (Azerbaijan, Belarus), EWT has not been effective in holding down wage awards. If it is successful and SOEs find themselves squeezed, immediately bargains are struck to avoid paying EWT (Poland, Hungary) or ways are found to get around the tax (Russia).

Applied to the wage rate, EWT is skewed against capital intensive industries with high productivity workers. Applied at the corporate rate (excess wages not allowed as a cost) it starts to become a value-added tax but a highly discriminatory and distortionary one, somewhat like the confused (and startlingly distortionary) example in France in 1975. 1/

The EWT may not be too difficult to administer except that the incentive for collusion to evade the tax between the managers and the employees is great. The definition of wages has to be all-embracing to prevent circumvention using special bonuses, pension fund payments, contribution to vacation funds, rent payments, free meals, transport costs, and so on, as observed in Russia. As noted by Dildine and Sunley (1978), *"(e)xperience with wage measurement problems of the income tax suggests that*

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1/ This extremely controversial tax applied to wages and profits, was suspended in September of the year it was introduced, forgiven for the first two quarterly payments, reintroduced in 1976 but not applied, introduced again in 1977, and again not applied, and finally, like the Cheshire cats' grin, faded from view forever; see de Wulf (1986) and Chand (1981, 1986) for descriptions. This emphasizes the difficulty, experienced in most countries reviewed in this paper, of administering this tax in the face of intransigent non-compliance.

*opportunities for substituting forms of compensation that understate the true increase in labor cost cannot be completely eliminated.*" (p. 389). If EWT is to operate for anything but the shortest time, allowances have to be made for promotions, new machinery skills, and productivity. <sup>1/</sup> The experience of economies in transition suggests that arrears can build up in firms that are so politically sensitive that tax collection is almost impossible, exemptions are made and efficient administration starts to collapse as those paying the EWT resent those avoiding it and compliance is eroded (Poland).

For a given policy of financial restraint and a given pace of change to privatization and competition, proponents argue that an EWT will enable inflation to fall faster with less loss of output than would simply relying on financial policies. Conclusive empirical testing is probably not possible with the limited data currently available for economies in transition. However, experience in both Western and Eastern economies suggests EWT are usually unsuccessful in controlling wage awards and, if successful, they are distortionary. It is much better to control credit expansion, impose credible hard budget constraints and performance requirements on SOEs, permit bankruptcy when necessary, and, gradually, open the protected SOEs to competition and privatization. The only role for an EWT might be as a temporary transitional measure on the way to privatization and competition but, even in that role, the distortions introduced would likely slow the pace of transition, discourage rapid adaptation, and penalize efficiency and innovation.

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<sup>1/</sup> See the Belgian example in 1976 in Chand (1981).

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The Profit-Maximizing Enterprise:  
Comparison of Wages and Employment Without and With EWT  
With Two Types of (Skilled and Unskilled) Labor

The proof presented here serves to generalize the heterogeneous labor model in Section II.4. In that section, we assumed that  $\alpha = 1$  hence  $n_2$  may not be paid a wage less than  $\bar{w}$ . However, if  $\alpha > 1$ , then it is possible that the  $n_2$  class of workers are paid a wage less than  $\alpha\bar{w}$ .<sup>1/</sup> Then, how does EWT affect  $w_2 < \alpha\bar{w}$  along with  $w_1 > \alpha\bar{w}$  under monopsony? This case is interesting because it sheds light on whether EWT creates an incentive for the firm to surround a few high-wage employees (managers),  $n_1$ , with many low-wage employees (workers),  $n_2$ . With  $\alpha > 1$ , from (3) and (6), the enterprise profit without and with EWT are, respectively, <sup>2/</sup>

$$\pi = (1-\tau)[f(n_1, n_2) - w_1 n_1 - w_2 n_2] \quad (43)$$

$$\pi^* = (1-\tau)f(n_1, n_2) - (w_1 - \alpha\tau\bar{w})n_1 - (1-\tau)w_2 n_2 ; \quad (44)$$

$$w_1 > \alpha\bar{w} ; w_2 < \alpha\bar{w}$$

As explained in Section II.2, using (43) and (44), we can show that the (effective) marginal cost of  $n_1$  with EWT is unambiguously greater than the marginal cost without EWT since

$$n_1 > -(w_1 - \alpha\bar{w})n_1' \quad (45)$$

for all

$$w_1 > \alpha\bar{w} ; n_1 > 0 ; n_1' > 0 ; w_2 > 0 .$$

<sup>1/</sup> The authors are grateful to the participants of a seminar at the Department of Economics, Clemson University, for pointing out this possibility, which had been omitted in the previous version of the paper.  
<sup>2/</sup> Notice from (44) that, trivially, EWT does not apply in the reverse, that is, the enterprise does not receive a subsidy for paying  $w_2 < \alpha\bar{w}$ .

We are interested in the impact of the increase in the marginal cost of  $n_1$  under EWT on the amount of both types of labor employed by the firm, hence on the wages paid; that is, we wish to compare  $(n_1^*, w_1^*)$  and  $(n_2^*, w_2^*)$  with  $(n_1, w_1)$  and  $(n_2, w_2)$ .

The first and second-order conditions which follow from (43) are 1/

$$f_1 = \frac{n_1 + w_1 n_1'}{n_1} = g_1(w_1) ; f_2 = \frac{n_2 + w_2 n_2'}{n_2} = g_2(w_2) ;$$

$$\pi_{11} < 0 ; \pi_{22} < 0 ; \Delta = (1-\tau)^2(\pi_{11}\pi_{22} - \pi_{12}) > 0$$

where (46)

$$\pi_{11} = (1-\tau)[f_{11}(n_1')^2 - 2n_1' + (f_1 - w_1)n_2'''] ;$$

$$\pi_{22} = (1-\tau)[f_{22}(n_2')^2 - 2n_2' + (f_2 - w_2)n_1'''] ;$$

$$\pi_{12} = (1-\tau)(f_{12}n_1'n_2') .$$

Totally differentiating the first-order conditions in (46) and making the relevant substitutions, we can show that

$$\frac{dw_1}{dw_2} = -\frac{f_{12}n_1'n_2'}{\pi_{11}} ; \frac{dw_2}{dw_1} = -\frac{f_{12}n_1'n_2'}{\pi_{22}} . \quad (47)$$

Therefore,  $dw_1/dw_2 > 0$  and  $dw_2/dw_1 > 0$ , provided that  $f_{12} > 0$  and  $n_1', n_2' > 0$ . Since it is also clear from (46) that  $dg_1 = g_1'dw_1$  and  $dg_2 = g_2'dw_2$ , it follows that  $dg_1/dg_2 > 0$ . 2/

1/ Notice that (44) can be written as  $\pi^* = (1-\tau)[f(n_1, n_2) - \hat{w}_1 n_1 - w_2 n_2]$  where  $\hat{w}_1 = (w_1 - \alpha r \bar{w}) / (1-\tau)$ . Therefore, the first and second-order conditions for maximizing  $\pi^*$  and  $\pi$  can be evaluated by using the modified expression above for  $\pi^*$  or by using (43).

2/ As in (13), we can show that  $f_1 - g_1 = (1+\theta_1)w_1/\theta_1$  and  $f_2 - g_2 = (1+\theta_2)w_2/\theta_2$ . If  $\theta_1$  and  $\theta_2$  are constant, as assumed, we have  $dg_1/dg_2 = \gamma(dw_1/dw_2) > 0$ , where  $\gamma = [(1+\theta_1)\theta_1] / [(1+\theta_2)\theta_2] > 0$ .

Further, totally differentiating the first-order conditions in (46), we can show that

$$f_{11}dn_1 + f_{12}dn_2 = dg_1 ;$$

$$f_{12}dn_1 + f_{22}dn_2 = dg_2 ;$$

hence

$$\frac{dn_1}{dg_1} = (1/\hat{\Delta})(f_{22} - f_{12}\frac{dg_2}{dg_1}) ; \quad (48)$$

$$\frac{dn_2}{dg_1} = (1/\hat{\Delta})(f_{11}\frac{dg_2}{dg_1} - f_{12}) ;$$

$$\hat{\Delta} = f_{11}f_{22} - f_{12}^2 .$$

Since  $dg_1/dg_2 > 0$ , the signs of  $dn_1/dg_1$  and  $dn_2/dg_1$  would be negative provided that

$$f_{11} < 0 ; f_{22} < 0 ; f_{12} > 0 ; \hat{\Delta} > 0 .$$

The foregoing conditions correspond to the first and second-order conditions in the perfectly competitive labor market case.<sup>1/</sup> While these conditions are neither sufficient nor necessary for profit maximization under monopsony, they are adequately general. They indicate that with decreasing marginal product for both types of labor and  $f_{12} > 0$ ,  $dn_1/dg_1 < 0$  and  $dn_2/dg_1 < 0$  under monopsony.

Therefore, under adequately general assumptions for the production function, it follows that, since  $g_1^* > g_1$ ,  $n_1^* < n_1$  because  $dn_1/dg_1 < 0$ , and,  $n_2^* < n_2$  since  $dn_2/dg_1 < 0$ . But  $n_1' , n_2' > 0$ , hence  $w_1^* < w_1$  and  $w_2^* < w_2$ . Therefore, the output and employment levels with EWT are less than they are without EWT, or  $f^*(n_1^*, n_2^*) < f(n_1, n_2)$ .

The foregoing results can be easily extended to the case discussed in Section II.4 with  $\alpha = 1$ ,  $w_2 = \bar{w}$  by simply noting that, in that case,

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<sup>1/</sup> Notice that in the competitive labor market case, the first-order conditions are  $f_1 = g_1(w_1) = w_1$  and  $f_2 = g_2(w_2) = w_2$ , where  $w_1$  and  $w_2$  are constants.

$dg_2 = d\bar{w} = 0$  , hence  $w_1^* < w_1$ ,  $n_1^* < n_1$ ,  $w_2^* = w_2 = \bar{w}$  ,  $n_2^* < n_2$ . 1/ Similarly, the same results are valid in the case of the perfectly competitive labor market if the second-order conditions for profit maximization hold and  $f_{12} > 0$ , since, in that case,  $dg_2 = dw_2 = 0$  also. We can similarly show that if both  $n_1$  and  $n_2$  are paid wages exceeding the norm, the marginal costs of both types of labor are increased ( $g_1^* > g_1$ ;  $g_2^* > g_2$ ), hence the same results obtain.

Thus, under an adequately general set of assumptions, when  $n_1$  and  $n_2$  are interpreted to be the managers and workers, we can conclude that the incidence of EWT is on both the managers and the workers. Under EWT, the profit-maximizing enterprise does not surround a few high-wage employees with many low-wage employees in order to reduce the tax burden.2/ With heterogeneous labor, irrespective of whether some classes of labor are paid wages below the norm ( $\alpha\bar{w}$ ), as long as some workers are paid wages exceeding the norm, EWT results in a decline in the wages and employment of all classes of labor, hence a decline in output.

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1/ Further notice that the model in Section II.4 is useful in determining the impact of EWT on the level of capital employed by the firm. In that model, if we treat  $n_2$  as capital,  $k$ , and assume that the rental on capital is given as  $r$ , by substituting  $k$  for  $n_2$  and  $r$  for  $\bar{w}$  in (27), we can see that the foregoing proof that  $n_2^* < n_2$  also indicates that, with  $f_{12} = f_{nk} > 0$ , we have  $k^* < k$ , where  $k^*$  and  $k$  are respectively the level of capital employed with and without EWT. That is, with variable capital, EWT results in a decline in the level of capital employed by the firm.

2/ In contrast, see the case of self-seeking managers facing an inelastic labor supply, presented in Section III.2.



Behavior of  $w$  and  $w^*$  with respect to  $\bar{w}$

From (7), the first and second order conditions for maximum profit without EWT can be found respectively as

$$\frac{\partial \pi}{\partial w} = (1-\tau)[f_n n' - (n + w n')] = 0 \quad (49)$$

$$\frac{\partial^2 \pi}{\partial w^2} = (1-\tau)[(f_{nn}(n')^2 - f_{nn}'') - (2n' + w n'')] < 0 \quad (50)$$

where  $n'' = (\partial^2 n / \partial w^2)$ . Differentiating (49) with respect to  $\bar{w}$  and using (50), we can show that

$$(\partial^2 \pi / \partial w^2) \cdot (\partial w / \partial \bar{w}) = 0 \quad (51)$$

hence  $(\partial w / \partial \bar{w}) = 0$ .

However, from (8), the first and second order conditions for maximum profit with EWT can be found respectively as

$$\frac{\partial \pi^*}{\partial w^*} = (1-\tau) f_n \frac{\partial n}{\partial w^*} - [n + (w^* - \tau \bar{w}) \frac{\partial n}{\partial w^*}] = 0 \quad (52)$$

$$\begin{aligned} \frac{\partial^2 \pi^*}{\partial w^{*2}} &= (1-\tau) [f_{nn} (\frac{\partial n}{\partial w^*})^2 + f_n (\frac{\partial^2 n}{\partial w^{*2}})] \\ &- [2 (\frac{\partial n}{\partial w^*}) + (w^* - \tau \bar{w}) (\frac{\partial^2 n}{\partial w^{*2}})] < 0 \end{aligned} \quad (53)$$

Differentiating (52) with respect to  $\bar{w}$  and using (53), we can show that

$$(\partial w^* / \partial \bar{w}) = -\tau [(\frac{\partial n}{\partial w^*}) / (\frac{\partial^2 \pi^*}{\partial w^{*2}})] \quad (54)$$

hence  $(\partial w^* / \partial \bar{w}) > 0$ .

For a sufficiently high minimum wage,  $\bar{w}_{\max}$ ,  $w^* = \bar{w}_{\max}$ ; and, for all  $\bar{w} < \bar{w}_{\max}$ ,  $\bar{w} \leq w^* < \bar{w}_{\max}$ . As  $\bar{w}$  rises,  $w^*$  rises and, finally,  $w^* = \bar{w}_{\max}$ , that is,  $f_n = \bar{w}_{\max}$ . Then, the monopsonist enterprise behaves like a competitive enterprise, that is, given  $\bar{w} \geq \bar{w}_{\max}$ , the enterprise chooses  $n$  to maximize  $\pi$ .

Self-seeking managers:  
comparison of the managers' wages without and with EWT

From (37) and (38), the managers' share without and with EWT can be shown as, respectively,

$$w_1 n_1 = f(n_1, n_2) - w_2 n_2 - \frac{\pi^E}{(1-\tau)} \quad (55)$$

$$w_1^* n_1 = (1-\tau)f(n_1, n_2^*) - (w_2^* - \tau\bar{w})n_2^* + \tau\bar{w}n_1 - \pi^E \quad (56)$$

Since  $n_1$  is assumed to be the same in both cases,  $w_1^* < w_1$  if  $w_1^* n_1 < w_1 n_1$ . From (56),  $w_1^* n_1$  can be expressed as

$$\begin{aligned} w_1^* n_1 = & [f(n_1, n_2^*) - w_2^* n_2^* - \frac{\pi^E}{(1-\tau)}] \\ & + \frac{\tau}{(1-\tau)} [\pi^E - (1-\tau)(f(n_1, n_2^*) - \bar{w}n_1 - \bar{w}n_2^*)] . \end{aligned} \quad (57)$$

Also notice from (56) that, for  $w_1^* n_1 > \bar{w}n_1$  ( $w_1^* > \bar{w}$ ) as assumed, it is necessary to have

$$\pi^E < (1-\tau)[f(n_1, n_2^*) - \bar{w}n_1 - \bar{w}n_2^*] - (w_2^* - \bar{w})n_2^* ; \quad (58)$$

$$w_2^* \geq \bar{w}$$

which indicates that the second term on the right-hand-side of (57) is negative. Since  $w_2^* < w_2$ , it is clear from (55) and (58) that

$$[f(n_1, n_2^*) - w_2^* n_2^* - \frac{\pi^E}{(1-\tau)}] < [f(n_1, n_2) - w_2 n_2 - \frac{\pi^E}{(1-\tau)}] \quad (59)$$

because the value of  $w_2$  for which (55) is maximum is different from the value of  $w_2$  for which (56) is maximum. Therefore, in view of (58) and (59),  $w_1^* n_1 < w_1 n_1$  hence  $w_1^* < w_1$ .

REPUBLIC OF BULGARIA  
Council of Ministers  
Decree No.28 of 9 February 1994  
on Adopting the Regulations  
on the Increment and Formation of Wage Funds in 1994

Article 1

- (1) These Regulations shall establish the way of regulating the increment and formation of wage funds in companies or other enterprises and organizations with more than 50 percent state and/or municipal participation (including joint ventures with foreign participation).
- (2) These Regulations shall determine also the terms and procedure of raising wage funds in companies or other enterprises and organizations engaged in business activities which receive subsidies from the state or municipal budgets or funds from extra-budgetary accounts of the Ministry of Finance.

Article 2

- (1) The increment of wage funds in companies, enterprises and organizations under Art. 1, para 1 for each quarter of 1994 compared to the basic reference amount of wage funds established in these Regulations shall be taxed in accordance with the following rates:

Percentage Increment of Wage Funds Compared to the Basic Reference Amount	Tax Rate Depending on the Average Monthly Gross Wage for the Respective Quarter of 1994 (in percent)			
	Up to 2 Minimal wages	Up to 3 Minimal wages	Up to 4 Minimal wages	More than 4 Minimal wages
Up to 2	--	--	--	--
More than 2 up to 3	10	50	75	100
More than 3 up to 4	20	75	100	200
More than 4 up to 5	50	100	200	600
More than 5	100	200	600	800

Note: Tax rates are distributed in four groups (columns) depending on the minimal wage established in the country for the respective quarter or 1994.

- (2) Tax rates under the table in the preceding paragraph shall apply separately to the amount of the wage funds increment which comes under the specific range. When the wage fund increment is more than 2 percent, the amount already taxed shall be deducted from the taxable

amount under the next range. In this case, only the balance between the two amounts shall be subject to taxation.

- (3) The tax due shall be paid pursuant to the provisions of Art. 75 of the Regulations on the Enforcement of Decree No. 56 on Economic Activities.
- (4) When the average monthly gross wages in companies, enterprises and organizations from the financial and lending system or the system of foreign trade exceed six-fold the minimal wage established in the country for the respective quarter of 1994, tax rates determined for the respective quarter of 1994 under para 1 shall be doubled.

Article 3

- (1) The basic reference amount of wages fund used to determine the increment under Art. 2, para 2 shall be established by adjusting the funds for the respective quarter of the preceding year:
  1. For companies, enterprises and organizations where the volume of sales of goods and services per person in comparable prices during the respective quarter of 1994 has increased in comparison to the respective quarter of the preceding year, without any debts in arrears to the state and/or municipal budgets, the State Social Security, the Training and Unemployment Fund or to commercial banks and the result during the relevant period is profit:
    - (a) by a coefficient equal to the quarterly estimate of the consumer price index for the country during the current quarter of 1994 compared to the respective quarter of the preceding year;
    - (b) by a coefficient obtained through a 0.6 adjustment of the percentage increment of the volume of sales of goods and services per person in comparable prices during the 1994 quarter compared to the respective quarter of the preceding year;
  2. For companies, enterprises and organizations where the volume of sales of goods and services per person in comparable prices during the respective quarter of 1994 has decreased in comparison to the respective quarter of the preceding year, without any debts in arrears to the state and/or municipal budgets, the State Social Security, the Training and Unemployment Fund or to commercial banks and the result during the relevant period is profit:
    - (a) by the coefficient under section 1, subsection (a);

- (b) by a coefficient obtained through a 0.3 adjustment of the percentage reduction of the volume of sales of goods and services per person in comparable prices during the 1994 quarter compared to the respective quarter of the preceding year;
3. For companies, enterprises and organizations where the volume of sales of goods and services per person in comparable prices during the respective quarter of 1994 has increased or decreased in comparison to the respective quarter of the preceding year, with debts in arrears to the state and/or municipal budgets, the State Social Security, the Training and Unemployment Fund or to commercial banks and the result during the relevant period is profit:
- (a) by the coefficient under section 1, subsection (a);
  - (b) by a coefficient obtained through a 0.3 adjustment of the percentage increment or reduction of the volume of sales of goods and services per person in comparable prices during the 1994 quarter compared to the respective quarter of the preceding year, the percentage increment of the volume of sales per person used to calculate the coefficient being restricted to 40 percent;
4. For companies, enterprises and organizations where the volume of sales of goods and services per person in comparable prices during the respective quarter of 1994 has increased or decreased in comparison to the respective quarter of the preceding year, without any debts in arrears to the state and/or municipal budgets, the State Social Security, the Training and Unemployment Fund or to commercial banks and the result during the relevant period is loss:
- (a) by the coefficient under section 1, subsection (a);
  - (b) by a coefficient obtained through a 0.3 adjustment of the percentage increment or reduction of the volume of sales of goods and services per person in comparable prices during the 1994 quarter compared to the respective quarter of the preceding year, the percentage increment of the volume of sales per person used to calculate the coefficient being restricted to 40 percent;
5. For companies, enterprises and organizations where the volume of sales of goods and services per person in comparable prices during the respective quarter of 1994 has increased in comparison to the respective quarter of the preceding year, with debts in arrears to the state and/or municipal budgets, the State Social Security, the Training and Unemployment Fund or to commercial banks and the result during the relevant periods is loss:

- (a) by the coefficient under section 1, subsection (a);
  - (b) by a coefficient obtained through a 0.2 adjustment of the percentage increment of the volume of sales of goods and services per person in comparable prices during the 1994 quarter compared to the respective quarter of the preceding year, the percentage increment of the volume of sales per person used to calculate the coefficient being restricted to 30 percent;
6. For companies, enterprises and organizations where the volume of sales of goods and services per person in comparable prices during the respective quarter of 1994 has decreased in comparison to the respective quarter of the preceding year, with debts in arrears to the state and/or municipal budgets, the State Social Security, the Training and Unemployment Fund or to commercial banks and the result during the relevant period is loss:
- (a) by the coefficient under section 1, subsection (a);
  - (b) by a coefficient obtained through a 0.6 adjustment of the percentage reduction of the volume of sales of goods and services per person in comparable prices during the 1994 quarter compared to the respective quarter of the preceding year, the amount of the coefficient being not less than 0.7.
- (2) Companies, enterprises and organizations shall apply the relevant section of para 1 for the respective quarters of 1994 depending on their specific financial and economic condition. When one or more debts are in arrears, the existence of debts in arrears shall be presumed.
  - (3) The percentage increment or reduction of the volume of sales of goods and services per person in comparable prices by industries and activities shall be calculated through the methodology of the National Statistical Office.
  - (4) The result during the relevant period - profit or loss within the meaning of para 1, sections 1-6 shall be established on the basis of the Income Statement in the Annex to Art. 40, para 1, section 2 of the Accountancy Act less the unspecified tax on the wage funds increment during the current quarter.
  - (5) When the actual accrued level of the consumer price index for the respective quarter of 1994 exceeds the estimates by more than 6.2 percentage points compared to the fourth quarter of 1993, the estimate index shall increase by 70 percent of the balance for the subsequent quarters.

- (6) Companies, enterprises and organizations from the financial and lending system as well as those whose objects of activity include water supply and sewerage and those maintaining and operating students' hostels and canteens shall not apply the coefficient reflecting the increment or reduction of sales per person.
- (7) Companies engaged in shipbuilding or ship repair as well as companies, enterprise and organizations with the following objects of activity: mechanized services in arable farming, livestock breeding and erosion control; agrochemical services; land reclamation and irrigation; crop raising and livestock production; greenhouses; production of seeds and saplings shall either apply or not apply the coefficient for the volume of sales per person in accordance with the specificities of their operations, starting from the first quarter of 1994 and the approach adopted is not subject to alteration during the subsequent quarters.

Article 4

- (1) The tax on the wage funds increment shall be calculated and paid irrespective of the final financial results of companies, enterprises and organizations, i.e. profit or loss. Their amount shall be specified in Chapter Four of the Income Statement, Annex to Art. 40, para 1, section 2 of the Accountancy Act.
- (2) The loss reported in the annual financial statements of companies, enterprises and organizations with more than 50 percent state and/or municipal participation as a result of the tax on the wage funds increment calculated and paid in the course of the year shall not be covered during the subsequent year or at the expense of the state budget.

Article 5

- (1) Wage funds of companies, enterprises and organizations under Art. 1, para 2 shall be formed through adjusting the funds for the respective quarter of the preceding year or the preceding quarter of the current year by:
  1. A coefficient equal to the quarterly estimate of the consumer price index for the country during the current quarter of 1994 compared to the respective quarter of the preceding year or the preceding quarter of the current year;
  2. A coefficient obtained through a 0.2 adjustment of the percentage increment or 0.3 adjustment of the percentage reduction of the volume of sales of goods and services per person in comparable prices during the 1994 quarter compared to the respective quarter of the preceding year or the preceding quarter of the current year, the calculation in comparable prices begin based on the

methodology of the National Statistical Office by industries and activities.

- (2) Companies, enterprises and organizations under Art. 1, para 2 which receive subsidies from the state or municipal budgets or funds from the extra-budgetary accounts of the Ministry of Finance shall choose any of the two ways of forming wage funds under para 1 with respect to the basic reference quarter in accordance with the specificities of their operations, starting from the first quarter of 1994. The approach adopted shall not be subject to alterations during the subsequent quarters.
- (3) When the actual accrued level of the consumer price index for the respective quarter of 1994 exceeds the estimates by more than 6.2 percentage points compared to the fourth quarter of 1993, the estimate index shall increase by 70 percent of the balance for the subsequent quarters.
- (4) When wage funds of the respective quarter of 1994 exceed the funds established under paras 1 and 2, the full amount of the surplus shall be deducted from the subsidies or funds received from extra-budgetary accounts of the Ministry of Finance. The surplus shall not be included in the basic reference amount used to calculate the wage funds during the subsequent quarters of 1994.
- (5) The average monthly gross wage for the respective quarter of 1994 in companies, enterprises and organizations receiving subsidies for the state and/or municipal budgets or funds from extra-budgetary accounts of the Ministry of Finance shall not exceed the six-fold amount of the minimal monthly wage established in the country for the same period.

Article 6

Companies enterprises and organizations subject to full liquidation shall raise wage funds on a quarterly basis for 1994 as of the date of the announcement of the liquidation on the basis of the average gross wage for the preceding quarter and the actual number of the remaining staff (less persons on maternity leave), adjusted by the applicable coefficient when the reference basis is the preceding quarter.

Article 7

- (1) When the amount of wage funds in companies, enterprises or organizations cannot be established of the respective quarter of the preceding year (the preceding quarter), it shall be determined through multiplying the actual number of staff during the 1994 quarter by the average wage for the respective activity during the respective quarter of 1993 (the preceding quarter) in accordance with the statistical reports, adjusted pursuant to the provisions of Art. 3 or 5. The



information about the average wage for the respective activity shall be provided by the National Statistical Office.

- (2) Paragraph 1 shall not apply to new joint ventures with foreign participation established in 1994. They are free to determine the average gross wage used to calculate the basic reference amount of wage funds during the subsequent quarters of 1994. It cannot exceed the six-fold amount of the minimal wage established in the country for the respective quarter of 1994.

Article 8

- (1) The wage funds for the respective quarter of 1993 shall be subject to readjustment when the average number of staff (less persons on maternity leave) in the company, enterprise or organization has increased or decreased in the course of the current quarter of 1994 compared to the reference quarter as a result of:
1. Establishment or closing down of subdivisions (structural units);
  2. Expansion of operations and increase or reduction of shifts;
  3. Shift of subdivisions (structural units) from or to the corporate structure of the company, enterprise or organization;
  4. Leasing of facilities;
  5. Started liquidation of operations or activities.
- (2) The readjustment under para 1 shall be calculated through increasing or reducing the wage funds of the respective quarter of 1993 by an amount obtained as the production of the difference in the average number of staff (less persons on maternity leave) and the average gross wage in the company, enterprise or organization as a whole during the respective period of the preceding year.

Article 9

- (1) The provisions of Art. 8, para 1 shall apply also to the wage funds for the preceding quarter used as the reference basis under Art. 5, para 2 in companies, enterprises and organizations receiving subsidies from the state or municipal budgets or funds from extra-budgetary accounts of the Ministry of Finance.
- (2) The readjustment under para 1 shall be calculated through increasing or reducing the wage funds for the respective quarter of 1993 by an amount obtained as the product of the difference in the average number of staff (less persons on maternity leave) between the current and the preceding quarter and the average gross wage in the company, enterprise or organization as a whole during the preceding quarter.

Article 10

The application of these Regulations to the wage funds during the quarters of 1993 and 1994 shall exclude the amounts actually paid during the respective quarters for compensations under Arts. 22 and 224, para 1 of the Labor Code, the remuneration paid to members of Supervisory Boards, Boards of Directors, Chief Executive Officers, Managers and Comptrollers of companies, enterprises and organizations with more than 50 percent state or municipal participation as well as the remuneration paid pursuant to the provisions of Section 6 of Order No. 7 of 1991 of the Council of Ministers on the Development and Safety of Nuclear Power Generation (Not promulgated).

Article 11

The Ministry of Labor and Social Affairs shall provide clarifications as to the enforcement of these Regulations.