When Do Firing Taxes Matter?

Giulio Fella*

Department of Economics, Queen Mary, University of London, UK

Abstract

Firing taxes have real effects only if layoffs are subsidized relative to quits, as it is Pareto optimal to label a separation a quit whenever doing so maximizes joint wealth. Given the size of layoff subsidies in OECD countries, firing taxes are an unlikely candidate to explain cross-country differences in labour market performance.

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JEL classification: E24; J64; J65

1 Introduction

It is well known, since Lazear's (1990) seminal paper, that if utility is freely transferable firing (or layoff) taxes - mandated payments to third parties - but not pure transfers between the firm and the worker affect the allocation of labour. For this reason, all the existing literature on the effect of firing costs under flexible wages[1] models firing costs as layoff taxes. The common result is that, firing taxes inefficiently reduce job creation and job destruction up to the point were all economic separations, other than those stemming from firms' bankruptcy, are eliminated.

This paper's starting point is the observation that in all countries mandated layoff costs are due only if a separation is labelled a layoff but not if it is a quit or a voluntary redundancy.

Two main results follow. First, mandated layoff taxes cannot affect the allocation of labour unless layoffs are subsidized relative to quits. If layoffs are taxed relative to quits both the firm and the worker are better off agreeing to label the separation a quit and exchanging spot side payments to split the gains from doing so. Second, layoff taxes inefficiently reduce job creation and job destruction only as long as they do not exceed the size of the (gross)

*Department of Economics, Queen Mary University of London, Mile End Road, London E1 4NS, UK. Tel +44 20 78825088; fax: +44 20 89833580

E-mail address: g.fella@qmul.ac.uk

[1]An incomplete list includes Millard and Mortensen (1997), Blanchard and Portugal (2000), Saint-Paul (2002).

layoff subsidy. If layoff taxes exceed such upper bound their marginal effect is zero and the resulting allocation is the same one that would prevail in the *laissez-faire* equilibrium in which the choice between layoffs and quits is undistorted.

Layoffs are indeed subsidized relative to quits in a number of countries, as unemployment benefits are imperfectly experience-rated *and* workers temporarily or permanently lose entitlement to benefits in case the separation is labelled a quit or a voluntary redundancy. Yet, we document that the upper bound on the layoff subsidy associated with the conditionality of unemployment benefits does not exceed ten weeks of wages in a large number of OECD countries. On the basis of the extensive numerical simulations of the effect of firing taxes in Ljungqvist (2002), layoff taxes in this range cannot explain but a negligible fraction of the differential labour market performance of these countries versus, for example, the US.

The results suggests that if firing costs have significant allocational effects, as implied by, for example, Kugler and Saint-Paul (2004) and Autor, Donohue and Schwab (2006), these must be due to the transfers that they induce. For such transfers to matter utility must be non-transferable. In the latter case, though, employment protection has ambiguous, and possibly welfare-enhancing, effects as shown by Fella (2000) and Alvarez and Veracierto (2001).

2 The model

2.1 Environment

The economic environment is effectively the same as in Mortensen and Pissarides (1999). Time is continuous. All agents live forever and discount the future at rate r. The total mass of workers is one. Each firm consists of a job. Keeping an open vacancy involves a flow cost c and there is free entry of vacancies.

Matching frictions are captured by a constant returns to scale, strictly concave, matching technology $m(u, v)$, where u is the number of unemployed workers and v the number of vacancies. Let $\theta = v/u$ denote market tightness. The rates at which searching firms and workers find a match are respectively $q(\theta) = m(u, v)/v$ and $p(\theta) = m(u, v)/u$.

Upon meeting a firm and a worker negotiate an initial wage w_0 and start producing a flow of output $\bar{y}$ until a shock takes place. Shocks hit all jobs at Poisson rate λ. Following a shock the match-specific value of productivity takes a new value $y \in [0, \bar{y}]$, with y distributed according to a continuous cumulative density function $G(y)$. After observing the new productivity realization the parties decide whether to continue or end the match. If the match continues, the wage is renegotiated to a new value $w(y)$. The surplus from a match is shared according to the asymmetric Nash bargaining solution, with $0 < \beta < 1$ denoting the worker's weight in bargaining.

If a match ends in separation the worker is entitled to a positive flow of benefit $\bar{b}$ and the firm has to pay a firing tax[2] T, unless the firm-worker pair declares the separation a quit or a voluntary redundancy. In the latter case no taxes are due but the worker receives

[2]It follows from Lazear (1990) that we can disregard severance payments.

no benefit. Following the existing literature, T captures the net output cost of red-tape, wasteful employment protection measures. An unemployed worker receiving benefits loses entitlement to them at Poisson rate δ.

Attention is restricted to steady state equilibria.

2.2 Bellman equations

The joint payoff $Z(y)$ from a match with productivity y satisfies the Bellman equation

$$rZ(y) = y + \lambda \left[\int_R^{\bar{y}} Z(y')\, dG + G(R)Z(R) - Z(y) \right]. \tag{1}$$

With transferable utility, the marginal job yields no rents and the joint reservation payoff $Z(R)$ and the joint payoff from separation coincide.

Let W_0 and W denote a worker's expected utilities from a new and continuing match respectively. Such values satisfy

$$rW_0(b) = w_0(b) + \lambda \left[\int_R^{\bar{y}} W(y')\, dG + G(R)W(R) - W_0(y) \right], \tag{2}$$

and

$$rW(y) = w(y) + \lambda \left[\int_R^{\bar{y}} W(y')\, dG + G(R)W(R) - W(y) \right], \tag{3}$$

where $b = \{0, \bar{b}\}$.

The corresponding values of a new and continuing match are

$$J_0(b) = Z(\bar{y}) - W_0(b) \tag{4}$$

and

$$J(y) = Z(y) - W(y). \tag{5}$$

The Bellman equation for the value of an open vacancy V satisfies

$$rV = -c + q(\theta) \left[Z(\bar{y}) - \frac{u^b}{u} W_0(\bar{b}) - \left(1 - \frac{u^b}{u}\right) W_0(0) - V \right] = 0, \tag{6}$$

with u^b the number of unemployed workers entitled to benefits.

Denote by $U(b)$ the value of being unemployed while receiving benefits equal to b. The value of employment in a new and continuing match satisfies respectively

$$W_0(b) - U(b) = \beta[Z(\bar{y}) - U(b)] \tag{7}$$

and

$$W(y) - U(\bar{b}) = \beta[Z(y) + T - U(\bar{b})]. \tag{8}$$

The difference between the ex ante bargaining solution in equation (7) and the ex post one in (8) is due to two reasons. First, the firing tax T is not incurred if a meeting is not turned into a match[3] . Secondly, a worker is entitled to the unemployment benefit $\bar{b}$ unless the parties agree to label the separation consensual or a quit[4]. Instead, unemployed workers may have lost entitlement to benefits.

The value of unemployment $U(b)$ solves

$$rU\left(b\right) = b + p\left(\theta\right)\left[W_0(b) - U\left(b\right)\right] + \delta\left[U\left(0\right) - U\left(b\right)\right]. \tag{9}$$

To determine the joint reservation payoff $Z(R)$, note that, conditional upon separation, it is Pareto optimal to label the separation decision so as to maximize the joint payoff from separation. Therefore it is

$$Z(R) = U(0) + S, \tag{10}$$

where

$$S = \max\left\{0, U\left(\bar{b}\right) - U\left(0\right) - T\right\} \tag{11}$$

is the effective separation subsidy[5].

Labelling the separation a layoff is Pareto optimal if and only if the expected present value of benefits $U\left(\bar{b}\right) - U\left(0\right)$ accruing to a worker if the separation is labelled a layoff exceeds the firing tax T.

The worker's separation payoff obtains by replacing for $Z(R)$ in equation (8) using (11) to obtain

$$W(R) = (1-\beta)U(\bar{b}) + \beta\max\{U(0) + T, U(\bar{b})\}. \tag{12}$$

If labelling the separation payoff a quit is efficient, the worker receives strictly more than the utility from being unemployed receiving benefit $\bar{b}$. This is achieved by the firm paying the worker a (voluntary) severance payment $W(R) - U(0)$, which not only compensates the worker for giving up benefits but transfers to the worker part of the saved tax T.

Evaluating (9) at $b = \bar{b}$ and $b = 0$ after replacing for $W_0(b)$ using (7), one can solve for the size of the layoff subsidy

$$U\left(\bar{b}\right) - U\left(0\right) = \frac{\bar{b}}{r + \delta + p\left(\theta\right)\beta}. \tag{13}$$

[3]The two-tier wage structure assumed captures exactly the feature that firing taxes do not alter ex ante bargaining power as they are not due if a match is not turned into a job. As (7) and (8) make clear, given risk neutrality only the present value of payments matter. It is irrelevant whether the initial wage $w_0(b)$ is replaced by an upfront monetary transfer at the time employment starts or whether, as convincingly argued by MacLeod and Malcomson (1993), the initial contract wage is persistent as it can be renegotiated only by mutual consent.

[4]Threat points in the ex post bargaining problem could differ if one were to assume, not unrealistically, that a separation is deemed a quit if a worker unilaterally walks out. Given transferable utility, alternative ex post threat points have only distributional effects.

[5]The set of feasible payoff pairs satisfies $J(y) + W(y) \leq \max\{Z(y), U(0), U(b) - T\}$. Since, the frontier associated with each of the three possibilities has a constant slope of minus one, the Pareto frontier coincides with the frontier associated with the highest joint payoff.

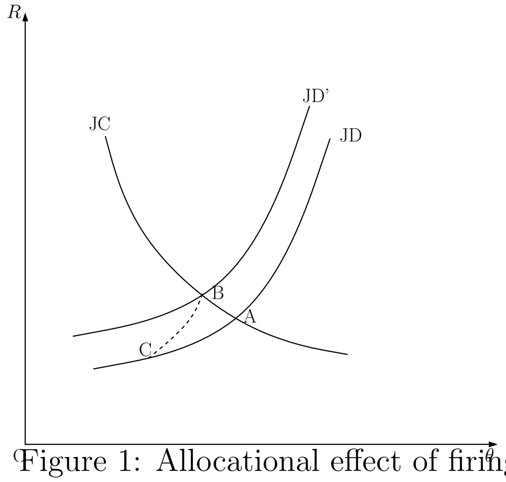

Figure 1: Allocational effect of firing taxes.

Finally, the flows in and out of the pools of, respectively, unemployed workers and benefit claimants have to equal or

$$\lambda G\left(y_r\right)(1-u) = p\left(\theta\right)u, \tag{14}$$

and

$$(p(\theta)+\delta)u^b = \mathbf{1}_T \lambda G\left(y_r\right)(1-u), \tag{15}$$

where u^b is the stock of unemployed receiving benefits and $\mathbf{1}_T$ is an indicator function equal to zero if $S<0$ and all separation are quits and one otherwise.

3 Equilibrium

With standard manipulations the system of equations (1)-(15) can be collapsed into a job creation (JC) condition

$$\frac{c}{q(\theta)} = (1-\beta)\left\{\frac{\bar{y}-R}{r+\lambda} + \mathbf{1}_T\left[\frac{\delta b}{(p(\theta)+\delta)(r+\delta+p(\theta)\beta)} - T\right]\right\} \tag{16}$$

and a job destruction (JD) equation

$$(r+p(\theta)\beta)\max\left\{0, \frac{b}{r+\delta+p(\theta)\beta} - T\right\} + p(\theta)\beta\frac{\bar{y}-R}{r+\lambda} = R + \lambda\int_R^{\bar{y}} \frac{1-G(y')}{r+\lambda}dy. \tag{17}$$

It is easily verified that JC and JD are respectively downward and upward sloping in the (θ, R) space.

Figure 1 illustrates the effect of changes in b and T on the decentralized equilibrium. Point A corresponds to the decentralized equilibrium in the absence of policy intervention; i.e. $b=T=0$.

Consider first the introduction of an unemployment benefit with positive average duration $1/\delta$. This shifts up the orginal JD curve to JD'. In the standard case in which benefits last forever - $\delta = 0$ - the job creation curve is unaffected. The new equilibrium at point B has lower job creation and higher job destruction relative to the *laissez-faire* equilibrium A.

Introducing a positive T shifts the JD' and JC loci respectively to the right and left in the (θ, R) space. Their intersection moves south west of point B along the dashed line. As long as layoffs are subsidized, the standard result that firing taxes depress job creation and job destruction relative to point B applies.

The novel result is that further increases in T, beyond the point where the net layoff subsidy in the curly bracket in equation (17) goes to zero, cease to have any allocational effect. At this point the equilibrium jumps from point C back to the *laissez-faire* equilibrium at A as all job destructions are labelled as quits[6]. Job creation is actually higher than at point B[7]. In short, the allocational and welfare effects of firing taxes are highly non-monotonic and bounded.

Finally, to the extent that benefits reduce efficiency - measured by aggregate output net of vacancy posting costs and layoff taxes - relative to *laissez-faire*[8], large enough firing taxes are actually efficiency-enhancing.

4 The size of layoff subsidies

The previous subsection has argued that the relevance of firing taxes depends on their magnitude relative to layoff subsidies. So it is important to understand the size of layoff subsidies in reality. This section constructs an upper bound for layoff subsidies for a number of OECD countries.

The maximum relevant size of the firing tax is given by $U(b) - U(0)$ in equation (13), which implies an upper bound equal to $h = b/\delta$, where δ is the inverse of benefit duration. In fact, in a number of countries entitlement to unemployment benefits is lost only for a limited period in case of voluntary separation. In such a case, one upper bound on the layoff subsidy equals the size of benefits time the length of the penalty period.

The fourth column in Table 1 reports the size of the tighter of these two upper bounds measured in weeks of the last wage. Starred numbers correspond to the quantity h. In that case, the ratio between the quantities in the fourth and second columns is benefit duration as reported in Nickell (1997). Otherwise the upper bound on the layoff subsidy is the product of the replacement rate in the second column time the length of the penalty period in the third column. In some countries this is chosen from inside a range by the body administering unemployment benefits according to the reported reason for separation.

[6] The job creation locus shifts discontinuously from C to A as the indicator function $\mathbf{1}_T$ jumps and the proportion of workers receiving benefits falls discontinuously to zero.

[7] For $\delta > 0$, the only difference is that for δ large enough point B is north-east of point A.

[8] This is indeed the case if Hosios's (1990) condition, requiring workers' Nash bargain share to coincide with the elasticity of the probability of filling a vacancy, is satisfied. It is also true in the numerical simulations in Mortensen and Pissarides (1999).

Table 1: Upper bound on layoff subsidy for selected OECD countries

	Replacement rate	*Penalty (weeks)*	*Layoff subsidy (weeks of wages)*
Belgium	0.6	8-52	5-31
Denmark	0.9	∞	130*
Finland	0.63	∞	66*
France	0.57	17†	10
Germany	0.63	0-12	0-8
Ireland	0.37	0-9	0-3
Italy	0.4	∞	10*
Netherlands	0.7	0	0
Norway	0.65	4-∞	3-51*
Portugal	0.65	∞	21*
Spain	0.7	0	0
Sweden	0.8	3-8	2-6
UK	0.38	0	0
US	0.5	∞	12*

Source: U.S Deparment of Health and Social Services, *Social Security Programs Throughout the World* (2002) and Nickell (1997).
† The employment office can grant unemployment benefits to workers who have quit their previous job, provided they have been unemployed, and actively searching, for 120 days.

It is clear that the upper bound on the layoff subsidy is quite low in a significant number of countries. In fact, it does not exceed ten weeks of wages for half of the countries in the table. This is even more striking for the 'Big Four' European countries: Italy, France, Germany and Spain which account for the bulk of the European unemployment problem and are often characterized as having very rigid labour markets.

Of the countries in Table 1, the US is the only one in which benefits are experience rated, albeit only partially. Since the experience-rated nature of the US unemployment benefit system implies a firing tax for the typical firm equal to roughly four weeks of wages[9], the upper bound on the difference in firing taxes between the US and half of the countries in Table 1 is 6 weeks. On the basis of the extensive numerical simulations of the effect of firing taxes in equilibrium unemployment models carried out by Ljungqvist (2002), firing taxes in this range would have negligible allocational and welfare effects.

This evidence suggests that if employment protection legislation has significant effects on the allocation of labour, it must be through the transfers it either prescribes or induces rather than through any third-party payment.

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[9] This equals the product of a 0.5 benefit replacement rate, 3 month average unemployment duration and an experience rate of 0.6 for the typical employer according to the estimates in Anderson and Meyer (2000).

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