Firing Tax vs. Severance Payment

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Motivation

- Many countries provide workers with job-security measures
- Garibaldi and Violante (2008) show that lay-off costs have two components
- (i) transfers from firm to worker and (ii) a tax outside the firm/worker pair
- (i): Severance payments, paid to the worker and increases consumption opportunities
- Cozzi et al. (2010) and Fella (2009)
- (ii): Firing costs, wasteful tax that is non-Coasean
- Ljungqvist (2001) and Veracierto (2008)
- Alvarez and Veracierto (1998) consider both types of costs
- They find that severance payments decrease unemployment and increase welfare

Household's Problem

We assume a representative household supplying one unit of labor inelastically and household members pool income and insure each other against the unemployment risk. Agents preferences are given by

$$E_0 \sum_{t=0}^{\infty} \beta^t \left[\frac{\sigma}{\sigma - 1} C_t^{\frac{\sigma-1}{\sigma}} \right],$$

while facing the budget constraint

$$C_t + T_t = \mathcal{W}_t + bu_t + \Pi_t.$$

The FOC is given by

$$C_t^{-\frac{1}{\sigma}} = \lambda_t.$$

Market Structure

Trade in the labor market is uncoordinated, costly and time-consuming. Search takes place on a discrete and closed market. A worker can either be employed or unemployed and each firm has one job that is either filled, or vacant.

Total separations are given by

$$\rho_t = F(\tilde{z}_t).$$

Firms create new jobs at the rate m, being a homogeneous-of-degree-one matching-function

$$m\left(u_t, v_t\right) = m u_t^{\mu} v_t^{1-\mu}.$$

Market Structure (cont'd)

Then, the vacancy filling probability is

$$q\left(\theta_t\right) = m\left(u_t, v_t\right)/v_t.$$

Evolution of employment is

$$n_{t+1} = \left(1 - \rho_{t+1}\right)\left(n_t + m_t\right).$$

Finally, households own all shares in the firm and receive any of their profits as dividends each quarter.

Firm's Problem

Perfectly competitive firms consist of a continuum of different jobs. Aggregate productivity Z_t is common to all firms, the specific productivity z_{it} is idiosyncratic (every period it is drawn from a c.d.f. $F(z)$). Production technology is given by

$$y_{it} = Z_t n_{it} \int_{\tilde{z}_{it}} z \frac{f(z)}{1 - F(\tilde{z}_{it})} dz \equiv Z_t n_{it} H(\tilde{z}_{it}).$$

Then, the firm maximizes

$$\Pi_{i0} = E_0 \sum_{t=0}^{\infty} \beta^t \frac{\lambda_t}{\lambda_0} \left[y_{it} - \mathcal{W}_{it} - c v_{it} - G(z_{it}) \right],$$

the wage bill follows

$$\mathcal{W}_{it} = n_{it} \int_{\tilde{z}_{it}} w_t(z) \frac{f(z)}{1 - F(\tilde{z}_{it})} dz.$$

Firm's Problem (cont'd)

Furthermore, $G(\cdot)$ gives the total lay-off costs

$$G(z_{it}) = \left(k + \tilde{k}\right) \int_0^{\tilde{z}_{it}} z \frac{f(z)}{1 - F(\tilde{z}_{it})} dz,$$

$k \geq 0$ is the firing cost factor and $\tilde{k} \geq 0$ is the severance payment factor.

Wage Setting

Wages are set by individual Nash bargaining. Firm and worker maximize the Nash product

$$w = argmax\left\{W_t - U_t\,)^{\eta}(\,J_t - V_t + \left(k + \tilde{k}\right) z_t\,\right)^{1-\eta}\Big\}.$$

The optimality condition is given by

$$W_t(z_t) - U_t = \frac{\eta}{1-\eta}\left(J_t(z_t) + \left(k + \tilde{k}\right) z_t\right).$$

Asset value function in case of being employed now looks as follows

$$\begin{aligned} W_t(z_t) &= w_t(z_t) + E_t\beta_{t+1}(1-\rho_{t+1})\int_{\tilde{z}_{t+1}} W_{t+1}(z)\frac{f(z)}{1-F(\tilde{z}_{t+1})}dz \\ &+ E_t\beta_{t+1}\rho_{t+1}\left(U_{t+1} + \tilde{k}z_t\right), \end{aligned}$$

Wage Setting (cont'd)

The other two missing asset value functions remain unchanged and therefore read as

$$J_t(z_t) = Z_t z_t - w_t(z_t)$$
$$+E_t\beta_{t+1}\left((1-\rho_{t+1})\int_{\tilde{z}_{t+1}} J_{t+1}(z)\frac{f(z)}{1-F(\tilde{z}_{t+1})}dz - \rho_{t+1}(\tilde{k}+k)z_t\right),$$

$$\begin{aligned} U_t &= b + E_t\beta_{t+1}\theta_t q(\theta_t)(1-\rho_{t+1})\int_{\tilde{z}_{t+1}} W_{t+1}\frac{f(z)}{1-F(\tilde{z}_{t+1})}dz \\ &+ E_t\beta_{t+1}(1-\theta_t q(\theta_t)(1-\rho_{t+1}))U_{t+1}. \end{aligned}$$

Wage Setting (cont'd)

The individual real wage is given by

$$w_t(z_t) = \eta \left[Z_t z_t + c\theta_t\right] + (1-\eta)b$$
$$+ \left[\left(\eta - \eta\beta_{t+1}\rho_{t+1}\right) k + \left(2\eta - 1 - \beta_{t+1}\rho_{t+1}\right) \tilde{k}\right] z_t.$$

The threshold can then be found by solving $J_t(z_t) < -(\tilde{k} + k)z_t$,

$$\tilde{z}_t = \frac{(1-\eta)b + \eta c\theta_t - \frac{c}{q(\theta_t)}}{(1-\eta)Z_t + \left(1 - \eta + (\eta - 1)\beta_{t+1}\rho_{t+1}\right) k + 2(1-\eta)\tilde{k}}.$$

We find that

$$w^{SP} < w^{FC} \Rightarrow \tilde{z}^{SP} < \tilde{z}^{FC}.$$

Model Solution

Finally, we need to define the market clearing condition

$$Y_t = C_t + cv_t.$$

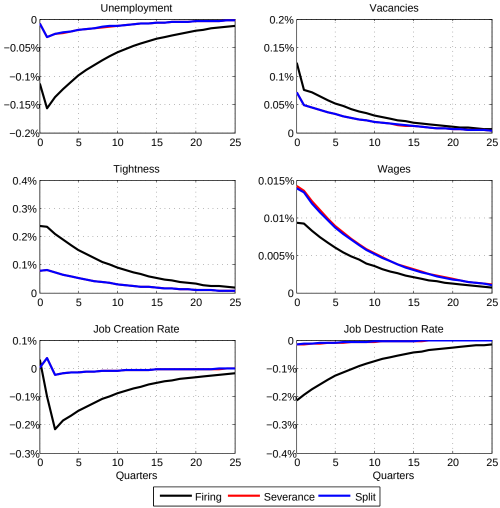
We assume an aggregate productivity shock that is AR(1), i.e.

$$Z_t = Z_{t-1}^{\rho_Z} e^{\epsilon_{Z,t}}.$$

Calibration

- $\rho = 0.12$, $n = 0.9$
- $\mu = 0.7$, $b = 0.5$
- $k = \tilde{k} = 0.1$

Business Cycle Fluctuations



Business Cycle Fluctuations (cont'd)

	Data	Severance	Firing	Split
Standard Deviations				
u	0.19	0.30	0.35	0.31
v	0.20	0.17	0.19	0.18
θ	0.38	0.46	0.54	0.48
ρ	0.08	0.17	0.21	0.18
jcr	-	0.39	0.48	0.42
jdr	-	0.40	0.48	0.42
Correlations				
u, v	-0.89	-0.96	-0.96	-0.96
jcr, jdr	-0.36	0.85	0.85	0.85

Notes: Theoretical moments. Data responds to U.S. values taken from Shimer (2005).

Welfare Gains

We follow Lucas (1987) and compare the expected discounted lifetime utility of the representative agent in two identical economies. Whereas, the first economy stays at the initial steady state, the second economy experiences a shock that triggers transitory dynamics. The welfare gain (loss) is then the Υ solution to

$$\mathcal{W}\left[\left\{(1+\Upsilon)\, C_t^{initial}\right\}_{t=0}^{\infty}\right] = \mathcal{W}\left[\left\{C_t^{final}\right\}_{t=0}^{\infty}\right].$$

Under our specification of utility, one can solve for Υ and obtain

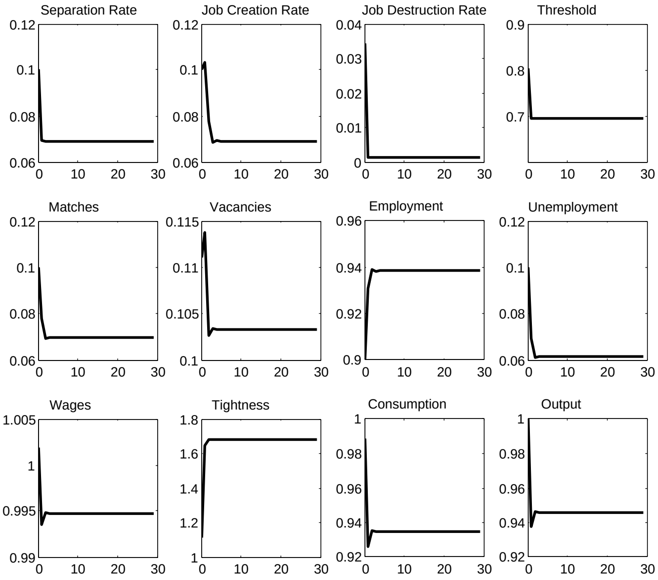
$$\Upsilon = \left[\frac{\mathcal{W}_j\left[\left\{C_t^{final}\right\}_{t=0}^{\infty}\right]}{\mathcal{W}_j\left[\left\{(1+\lambda)\, C_t^{initial}\right\}_{t=0}^{\infty}\right]}\right]^{\frac{\sigma_c}{\sigma_c - 1}} - 1.$$

The Effects of Using Lay-off Costs

	Firing	Severance	Severance & Firing
Welfare			
$100 * \Xi$	-8.36	-5.43	-6.19
Steady State			
Δu	-0.02	-0.38	-0.27
Δv	-0.72	-0.07	-0.43
$\Delta \Psi$	-0.33	-0.30	-0.32
Δjcr	-0.31	-0.31	-0.32
Δjdr	-0.96	-0.97	-0.99
Δw	0.002	-0.01	-0.002

Steady state changes are in percent of the initial steady state (where $k = \tilde{k} = 0$). The parameter governing the share of firing costs, severance payments resp. is increased from 0 to 0.1. For the latter case, where we increase k and $\tilde{k}$ simultaneously, we set both parameters to 0.05, such that they jointly equal 0.1.

The Effects of Using Lay-off Costs (cont'd)



Conclusion

- Paper compares two component of lay-off costs in a stylized RBC model
- Firing tax vs. severance payment along business cycle and welfare dimension
- We find that SP tend to decrease wages, while FC increase them
- Second moments: SP & FP outperformes standard model and creates strong Beveridge curve
- SP generate less volatility compared to FC
- Welfare: increase in share reduces welfare but increases employment
- Trade-off for the design of "optimal" employment protection