

Raising Rivals' Fixed (Labor) Costs: The Deutsche Post Case

Sven Heitzler and Christian Wey

Conference on Postal Services, Toulouse, 26 March 2010

Contents

- Motivation
- Related literature
- German labor market institutions
- The Deutsche Post case
- The model
- Analysis
- Conclusions

Motivation

Observation 1: *Strong incentives for both the union and the incumbent to implement minimum wage in postal services.*

- prior to full liberalization of postal services on January 1st, a massive campaign to implement minimum wage legislation started
- by the end of 2007 minimum wages were implemented
- How? (implemented through extension rules)
- Why is the alleged fundamental conflict of interest between a union and a firm absent in the presence of entry?

Motivation

Observation 2: *Mail delivery services are mainly fixed costs.*

- delivery services require a certain number of mailmen to ensure a given service quality
- given a certain service quality, the costs to operate the network are independent of the mail volume
- the costs to operate a delivery network depend on the efficiency of mailmen services and their wages

Motivation

Theoretical research questions:

- What are the conditions such that *both* the union and the incumbent agree on an entry deterring wage?
- Are there instances such that a more efficient competitor can be deterred from entry through minimum wages?
- Are there instances where overall productive efficiency decreases through minimum wages?

Motivation

Institutional change in the German labor market:

- erosion of Germany's system of collective bargaining between an industry union and an employer association
- globalization (outsourcing), re-unification, liberalization of former state monopolies etc.
- How to stabilize the system?
- extension rules become more important
- but, also a new trend: competition between independent unions
- How does the existing labor system react?

Related literature: The Pennington case

Williamson (1968), Wage Rates as a Barrier to Entry: The Pennington Case in Perspective, QJE.

- United Workers v. Pennington
- Pennington was a small coal mine operator
- Pennington was the plaintiff against an agreement between a union and an employers' association
- the claim was that this agreement violated the Sherman Act
- the union had accepted a wage agreement with an employer association
- the settlement stipulated that the union will impose the same wage contract on competitors

Related literature: The Pennington case

Application of antitrust laws on wage agreements. The court decided:

“a union may make wage agreements with a multi-employer bargaining unit and may in pursuance of its own union interests seek to obtain the same terms from other employers, ...[the] union forfeits its exemption from antitrust laws when it is clearly shown that it has agreed with one set of employers to impose a certain wage scale on other bargaining units.”

- Williamson: large employers do have incentives to increase wages strategically
- Logic: wage increase does hurt labor-intense competitors more than capital-intense firms
- hence, labor intense competitors may exit the industry when wage becomes large enough

Raising rivals' variable labor costs (Williamson)

Haucap, Pauly, Wey (2001) version:

→ *conditions under which both the union and the incumbents agree on an entry deterring minimum wage*

- Cournot competition with homogenous goods and demand $p(\cdot)$
- incumbents ($I = 1, \dots, k$) and entrants ($E = 1, \dots, n$) choose outputs x_i and x_j
- incumbent's labor productivity is higher: $1/\alpha_I > 1/\alpha_E$
- union negotiates with employers' association (incumbents) about a generally binding wage

- Profit of firm i :
$$\pi_i = \underbrace{p(\cdot)x_i}_{\text{Revenue}} - \underbrace{\alpha_i \cdot w \cdot x_i}_{\text{Labor costs}}$$

Raising rivals' variable labor costs (Williamson) (cont'd)

Result: Both, the union and the employers' association may have both incentives to deter entry.

For linear demand, equilibrium profit of the incumbent firm fulfill

$$\frac{d\pi_I^*}{dw} > 0 \Leftrightarrow \frac{\alpha_E}{\alpha_I} \geq \frac{n+1}{n}$$

until the entry deterring wage $\tilde{w}$ is reached, with $\tilde{w} : x_E^*(\tilde{w}) = 0$

- even small labor productivity advantages of the incumbent firm cause an incentive for raising rivals' (variable labor) costs
- common interest depends on how (double) mark-ups respond
- typically: minimum wages increase productive efficiency

Related literature

Rogerson, W.P. (1984), A Note on the Incentives for a Monopolist to Increase Fixed Costs as Barrier to Entry, QJE

- shows within a symmetric setting that there are strong incentives to increase fixed entry costs (e.g., by lobbying)
- hence: raising rivals' costs incentives also exist when they do affect fixed costs rather than marginal costs
- does not consider a vertical structure (with an upstream union)

-> **We combine in a single model:**

- Williamson (raising rivals' marginal labor costs) with
- Rogerson (raising fixed entry costs)

German labor market institutions

(for surveys see Haucap, Pauly, and Wey 2006, 2007)

Characteristics of the German labor market

- collective wage agreements between unions and employer associations at the industry level
- protection of collective wage agreements through various institutions (laws and legal practice)

=> Unresolved problem is how to stabilize against emerging outsider competition

German labor market institutions

New challenges:

- liberalization of former state monopolies (post, telecom etc.)
 - new markets: East Germany
 - creation of competition with unorganized firms employing unorganized workers
- > Increasing competition between unions on labor markets
- > Policy makers respond with softening implementation procedures for industry-specific minimum wages

German labor market institutions

Elements:

- German Constitution Art. 9: freedom to form coalitions to structure labor conditions (tariff autonomy)
- with this: exemption from cartel prohibition
- Law concerning tariff agreements (Tarifvertragsgesetz, TVG):
- firms, employer associations and unions are empowered to strike collective tariff agreements
- §5 TVG: Wage agreements can be declared **generally binding** (“Allgemeinverbindlicherklärung”), if
 - 50% of all employees in the respective area are covered,
 - it is in the public interest,

The German labor market institutions

The Posted Workers Act (1996; includes postal services since Dec. 2007):

“Goals of the law are the creation and enforcement of acceptable minimum working conditions for cross-border posted and regularly domestically employed workers as well as to ensure fair and functional competition conditions.”

- extension of existing collective labor contracts for employees of foreign firms and unorganized domestic firms
- eligible industries are mentioned explicitly
- only very little preconditions (basically only a collective labor contract is needed)
- Federal Ministry of Labor can decide by government decree

The Deutsche Post case - timeline

01.01.1998 Start of the liberalization process of postal market (admission of competitors)

From 2006 on, the date for full liberalization was set to **1.1.2008**

2006/2007 calls for minimum wages

August 2007 Federal government agrees on the introduction of minimum wages for the postal sector before the full market opening

21.08.2007 Establishment of the **Arbeitgeberverbands Postdienste e.V.** (dominated by Deutsche Post)

The Deutsche Post case - timeline (cont'd)

04.09.2007 Verdi (the incumbent industry union Universal Services Union) and AGV Postdienste agree upon a minimum wage tariff agreement

- **9,00 € und 9,80 €** for letter delivery staff (East/West)

- **8,00 € and 8,40 €** for other employees in the letter segment (East/West)

(Tariff agreement is explicitly conditioned on becoming declared generally binding
- otherwise it is void)

05.09.2007 Public complaints of the competitors (PIN and TNT)

The Deutsche Post case - timeline (cont'd)

12.09.2007 The competitors (members of the Bundesverbands Internationale Express- und Kurierdienste) establish their own employer association “**Arbeitgeberverband neue Brief- und Zustelldienste**” (**AGV neue BuZ**)

19.09.2007 Government coalition decides to limit the scope of the minimum wages to **letter mail services** only instead of postal services in general

08.10.2007 Establishment of the new **Union of the New Letter and Delivery Services (GNBZ)**

11.12.2007 GNBZ und AGV neue BuZ agree upon a **competing tariff agreement**:

- Minimum wage: **6,50 €** (East) and **7,50 €** (West)

The Deutsche Post case - timeline (cont'd)

14.12.2007 German Parliament passes the **amendment to the Posted Workers Act (AEntG)** which lists mail services as eligible for minimum wages

28.12.2007 The revision of the Posted Workers Act is also accepted by the German Upper House (Bundesrat). The same day, the **Minimum Wage decree** was issued by the Labor Ministry :

- **9,00 € und 9,80 €** for letter delivery staff (East/West)
- **8,00 € and 8,40 €** for other employees in the letter segment

The Deutsche Post case - timeline (cont'd)

01.01.2008 Full market opening in Germany

09.01.2008 Competitors file lawsuit against the Federal Republic of Germany at the Berlin Administrative Court

25.01.2008 PIN starts insolvency procedure

18.02.2008 TNT announces to leave the German market due to the minimum wages (TNT sticks with lower wages but must build up reserves)

07.03.2008 Berlin Administrative Court declares the minimum wage decree void (appealed)

31.03.2008 Roughly 50 per cent of the formerly 11.400 employees of PIN have been laid off

The Deutsche Post case - timeline (cont'd)

30.10.2008 Cologne Labor Court decides that the GNBZ is not empowered to negotiate collective wage agreements

22.01.2009 German Parliament passes a new amendment of the Posted Workers Act in order to support the minimum wage legislation

28.01.2010 Federal Administrative Court finally judged the declaration of the minimum wage void

....it still goes on...

The Deutsche Post case - interim conclusion

A study from the Federal Network Agency (2008) illustrates the wages of the competitors:

	Deutsche Post AG	East	Competitors West	Average
Sorting staff	11.34	6.11	8.10	7.68
Delivery staff	12.13	6.18	7.71	7.28

Source: BNetzA 2008: Hourly wages before the introduction of minimum wages

Clearly, the minimum wages are binding.

The Deutsche Post case - interim conclusion

The case highlights several strategic moves:

- establishment of an employer association as a prerequisite for minimum wages
- agreement on a wage rate with Verdi in order to increase costs strategically
- effects are disastrous for competitors: not a marginal reduction in output, but rather insolvency (PIN)

Counter strategies:

- establishment of a competing employer association
- and of a competing union
- conclusion of a competing collective contract

The Deutsche Post case - interim conclusion

Fundamental institutional questions remain open:

- Is the rival union “tariff enabled” according to the TVG? (“mightiness” criterion)
- Is the Federal Labor Ministry empowered to overturn an existing collective contract? (“tariff autonomy”)
- How should the Ministry trade-off the constitutional right to strike a collective agreement with the labor law’s intention to stabilize an industry-wide collective agreement? (“representativeness” criterion)

The model - primitives

- one union and two letter delivery network operators
- incumbent $i = 1$ with letter volume x_1
- entrant firm $i = 2$ with letter volume x_2
- inverse demand for mail delivery services $p(x_1 + x_2) = a - x_1 - x_2$
- non-labor marginal costs of firm i are given by $c_i \geq 0$
- ($c_1 = c$ and $c_2 = c + \Delta$)
- define $\alpha := a - c > 0$
- (fixed) labor costs for operating firm i 's delivery network $w_i \cdot \eta_i$
- w_i wage rate at firm i

The model - relative efficiency

- Δ stands for the relative cost efficiency of the entrant firm
- the relative cost efficiency of the entrant increases with lower values of Δ
- $\eta_2/\eta_1 \leq 1$ measures the relative network efficiency of the entrant
- a lower value indicates a higher efficiency level

The model - labor

- all workers of the incumbent firm are represented by a union
- the union maximizes the wage bill $L = w_1 \eta_1$
- all workers in the sector have the same reservation wage $\rho \geq 0$
- collective wage bargaining between the incumbent firm and the union
- union's disagreement point is $\rho \eta_1$
- we apply the Nash bargaining solution
- the workers of the entrant firm are not organized
- in the absence of an extension rule, the entrant pays the reservation wage $\rho \geq 0$

The model - timing and regimes

Two-stage game:

1. stage: union and incumbent bargain about the wage rate
2. stage: Cournot competition

Two labor market regimes:

- no extension rule ($w_1 = \hat{w}_1$ and $w_2 = \rho$)
- with an extension rule the negotiated wage becomes generally binding ($w_1 = w_2 = \bar{w}$)

The model - parameter assumptions

Notes:

- $R_i := [p(X) - c_i] x_i$. The Nash-Cournot equilibrium (x_1^*, x_2^*)

$$x_i^* = \arg \max_{x_i} R_i(x_i, x_j^*), \text{ for } i = 1, 2, i \neq j.$$

is assumed to be interior. It is independent of the wage and only depends on Δ .

- $\partial x_1^* / \partial \Delta > 0$ and $\partial x_2^* / \partial \Delta < 0$ holds, with $x_1^* = x_2^*$ at $\Delta = 0$
- $dR_1^D / d\Delta > 0$ and $dR_2^D / d\Delta < 0$, with $R_1^D = R_2^D$ if $\Delta = 0$

The model - parameter assumptions

Assumption 1. *We invoke the following parameter restrictions.*

- i) $\Delta \in (-\alpha, \frac{\alpha}{2})$ which ensures that both firms' equilibrium quantities are strictly positive, whenever the entrant firm enters the market.*
- ii) $\rho < \min \left\{ \frac{R_1^D}{\eta_1}, \frac{R_2^D}{\eta_2} \right\}$ which ensures that both the incumbent and the entrant firm make strictly positive profits if they pay the reservation wage to their employees.*
- iii) $\frac{\eta_2}{\eta_1} > \frac{R_1^D}{R_1^M}$ which guarantees that the incumbent's profit is strictly positive at the limit wage, $\tilde{w}$.*

The model - analysis without extension rule

- profit functions are given by

$$\pi_1 = (\alpha - X)x_1 - w_1\eta_1 \text{ and } \pi_2 = (\alpha - \Delta - X)x_2 - w_2\eta_2,$$

- optimal quantities are

$$x_1^* = \frac{\alpha + \Delta}{3} \text{ and } x_2^* = \frac{\alpha - 2\Delta}{3}.$$

- hence, $R_1^D = \left(\frac{\alpha + \Delta}{3}\right)^2$ and $R_2^D = \left(\frac{\alpha - 2\Delta}{3}\right)^2$

- $\hat{\pi}_2^D = R_2^D - \rho\eta_2$

The model - analysis without extension rule

- the Nash bargaining solution requires that the joint surplus $R_1^D = \left(\frac{\alpha + \Delta}{3}\right)^2$ is shared equally
- relative to the union's disagreement point $\rho\eta_1$
- Hence, the equilibrium wage bill, $\hat{w}_1\eta_1$, fulfills

$$R_1^D - \hat{w}_1\eta_1 = \hat{w}_1\eta_1 - \rho\eta_1.$$

The model - analysis without extension rule

Proposition 1. *Suppose that no extension rule exists. Then the entrant firm always enters the market, pays its employees the reservation wage and realizes the profit level $\hat{\pi}_2^D = R_2^D - \rho\eta_2$. In equilibrium the union and the incumbent settle on the wage rate*

$$\hat{w}_1 = \frac{1}{2} \frac{1}{\eta_1} [R_1^D + \rho\eta_1]$$

which implies a profit level of

$$\hat{\pi}_1^D = \frac{1}{2} [R_1^D - \rho\eta_1] ,$$

for the incumbent, while the union's wage bill is

$$\hat{L} = \frac{1}{2} [R_1^D + \rho\eta_1] .$$

The model - analysis with an extension rule

- denote the limit wage, where $R_2^D = w\eta_2$ holds, by $\tilde{w}$
- note $d\tilde{w}/d\Delta < 0$
- if $\bar{w} \geq \tilde{w}$, then the incumbent sets the monopoly output level, $x_1^M = \alpha/2$
- and realizes the monopoly net revenues $R_1^M = (\alpha/2)^2$
- depending on the generally binding wage rate, $\bar{w}$, the incumbent firm's profit function is then given by

$$\pi_1(\bar{w}) = \begin{cases} R_1^M - \bar{w}\eta_1 = (\alpha/2)^2 - \bar{w}\eta_1 & \text{for } \bar{w} \geq \tilde{w} \\ R_1^D - \bar{w}\eta_1 = [(\alpha + \Delta)/3]^2 - \bar{w}\eta_1 & \text{for } \bar{w} < \tilde{w}. \end{cases}$$

The model - analysis with an extension rule

- assume bargaining only occurs over a deterministic wage rate
- the resulting bargaining frontier $\Lambda(\pi_1)$ gives the maximum payoff of the union for a given profit level

$$\Lambda(\pi_1) = \begin{cases} R_1^M - \pi_1 & \text{for } 0 \leq \pi_1 \leq R_1^M - \tilde{w}\eta_1 \\ R_1^D - \pi_1 & \text{for } R_1^M - \tilde{w}\eta_1 < \pi_1 \leq R_1^D - \rho\eta_1. \end{cases}$$

- this is: we obtain a non-convex bargaining problem if

$$R_1^D - \rho\eta_1 > R_1^M - \tilde{w}\eta_1$$

-> **figure!**

The model - analysis with an extension rule

- we must “convexify” the bargaining frontier
- we use a lottery $l = (\tilde{w}, \rho; p, 1 - p)$ which chooses the limit wage, $\tilde{w}$, with probability $p \in [0, 1]$ and the reservation wage, ρ , with counter probability $1 - p$.
- the convexified bargaining frontier is

$$L(\pi_1) = \begin{cases} R_1^M - \pi_1 & \text{for } 0 \leq \pi_1 \leq R_1^M - \tilde{w}\eta_1 \\ [p\tilde{w} + (1 - p)\rho] \eta_1 & \text{for } R_1^M - \tilde{w}\eta_1 < \pi_1 \leq R_1^D - \rho\eta_1, \end{cases}$$

where the lottery fulfills

$$[p\tilde{w} + (1 - p)\rho] \eta_1 = \tilde{w}\eta_1 - \frac{\tilde{w}\eta_1 - \rho\eta_1}{(R_1^D - \rho\eta_1) - (R_1^M - \eta_1\tilde{w})} \cdot [\pi_1 - (R_1^M - \eta_1\tilde{w})].$$

The model - analysis with an extension rule

Applying the Nash bargaining solution to the convexified bargaining frontier and noting the union's disagreement payoff, $\rho\eta_1$, we obtain the following proposition which summarizes the equilibrium outcome under an extension rule.

Proposition 2. *Suppose that an extension rule exists. If $R_1^D - \rho\eta_1 \leq R_1^M - \tilde{w}\eta_1$, then entry is deterred for sure and the Nash bargaining solution yields the generally binding wage rate*

$$\bar{w} = \begin{cases} \frac{1}{2} \frac{1}{\eta_1} (R_1^M + \rho\eta_1) & \text{for } R_1^M - \tilde{w}\eta_1 \geq \tilde{w}\eta_1 - \rho\eta_1 \\ \tilde{w} & \text{for } R_1^M - \tilde{w}\eta_1 \leq \tilde{w}\eta_1 - \rho\eta_1. \end{cases}$$

The model - analysis with an extension rule

Proposition 2 (cont'd)

If $R_1^D - \rho\eta_1 < R_1^M - \tilde{w}\eta_1$, then the (expected) wage rate is given by

$$\bar{w} = \begin{cases} \frac{1}{2}\frac{1}{\eta_1}(R_1^M + \rho\eta_1) & \text{for } R_1^M - \tilde{w}\eta_1 \geq \tilde{w}\eta_1 - \rho\eta_1 \\ [p^*\tilde{w} + (1 - p^*)\rho] & \text{for } R_1^M - \tilde{w}\eta_1 \leq \tilde{w}\eta_1 - \rho\eta_1, \end{cases}$$

$$\text{with } p^* = \left[1 + \frac{(\tilde{w}\eta_1 - \rho\eta_1) - (R_1^M - \tilde{w}\eta_1)}{R_1^D - \rho\eta_1} \right]^{-1}.$$

Whenever the Nash solution requires to use a lottery, then the lottery must guarantee that the (expected) net joint surplus is shared equally which gives the condition

$$[p^*\tilde{w} + (1 - p^*)\rho]\eta_1 - \rho\eta_1 = p^*(R_1^M - \tilde{w}\eta_1) + (1 - p^*)(R_1^D - \rho\eta_1)$$

- from which we obtain p^*

The model - analysis with an extension rule

Corollary 1. *Deterrence of the entrant for sure becomes more likely and the probability of a limit wage increases, whenever the relative network efficiency of the entrant decreases (i.e., η_2/η_1 increases) or the relative cost efficiency of the entrant decreases (i.e., Δ increases).*

Corollary 2. *Suppose $\rho = 0$. If $\eta_2/\eta_1 = 1$, then a more cost efficient entrant is deterred from entry for sure for all $\Delta \in [\frac{\alpha}{2}(4 - 3\sqrt{2}), 0)$. If $\Delta = 0$, then an entrant with a more efficient network is deterred from entry for sure for all $\eta_2/\eta_1 \in (8/9, 1]$. Moreover, when the bargaining parties use a lottery to share their expected joint surplus, then deterrence of a more efficient entrant always occurs with some strictly positive probability.*

The model - comparison of labor market regimes

Corollary 3. *The (expected) wage rate under a regime with an extension rule is strictly larger when compared with a regime where no such rule exists. Moreover, the union's (expected) wage bill and the incumbent's (expected) profit are both strictly larger under an extension rule.*

The model - comparison of labor market regimes

- overall productive efficiency measured by mail unit costs
- focus on $\bar{w} = \frac{1}{2} \frac{1}{\eta_1} (R_1^M + \rho \eta_1)$, so that entry is deterred for sure
- unit mail cost when no extension rule is in place

$$\frac{cx_1^* + (c + \Delta)x_2^* + \eta_1 \hat{w}_1 + \eta_2 \rho}{x_1^* + x_2^*}.$$

- with an extension rule, unit mail costs become

$$\frac{cx_1^M + \eta_1 \bar{w}}{x_1^M}.$$

The model - comparison of labor market regimes

- duplication of fixed costs versus:

1) $x_1^* + x_2^* > x_1^M$ and

2) $\bar{w} > \hat{w}_1 > \rho$)

Example: If $\Delta = 0$, the comparison gives lower unit mail costs in the absence of an extension rule if

$$\rho \left(\eta_2 - \frac{1}{6}\eta_1 \right) < \frac{\alpha^2}{9}$$

Conclusion on raising rivals' fixed labor costs

1. Minimum wages are a particularly effective deterrence instrument when labor constitutes fixed costs
2. Drastic effects on competitors rather than “marginal” effects.
3. The conflict of interest between a union and a firm vanishes when the limit wage is relatively low.
4. A more efficient rival can be deterred.
5. Overall productive efficiency may decline.
6. Ongoing institutional change in Germany:
7. ...on the one hand there are tendencies to stabilize the system of centralized collective bargaining through minimum wage legislations (extension rules)
8. ...on the other hand it is not clear whether rival unions can be established...

9. then the questions arises: how to deal with competiton between unions?
10. The current labor market system should then be complemented by competition policy rules.