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Distributional impacts of a local living wage increase with ability sorting

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ABSTRACT

I develop a model of ability sorting of low-wage workers across multiple markets when one market substantially increases its wage floor using a living wage. The wage floor increase can increase or decrease employment probabilities in both covered and uncovered markets.

1. Introduction

The living wage movement in the US has caught on in over 140 cities since 1994. These ordinances usually require covered firms[1] to pay workers 50%–150% higher wages than the federal minimum wage. As a living wage ordinance is a sharply increased wage floor, one could expect economic outcomes to follow the classical minimum wage theory of Mincer (1976), with the living wage sector as the covered, and the minimum wage sector as the uncovered sector[2]: workers in the covered sector who earn the higher wage benefit, but all other workers are hurt. Studies have found contradictory employment and wage effects.[3]This disagreement mirrors the controversy surrounding the impact of minimum wage increase.[4]

Because the two sectors operate in close geographic (or industrial) proximity, workers and firms should be able to change sectors with ease. When firms and workers are mobile, relative employment change in the covered sector after a policy change may be driven in part by the interaction with the uncovered sector.

In a two-sided, two-sector search model with endogenous labor demand and supply that allows for ability sorting, workers and firms locate optimally to maximize expected returns yielding more complex results. A match generates revenue dependent only on worker ability and is split according to a Rubenstein bargaining game in the absence of a binding wage floor. A living ordinance "prices out" low-ability workers as matches are rejected by firms. These workers are driven to the uncovered sector, changing the employment probability and expected revenue from a match in both markets, inducing further moves by other workers and firms. The sorting of workers hinges on the knowledge of their ability ex ante. Workers anticipate whether they will be paid their share of the revenue (high, mid-ability), the wage floor (low ability), or be priced out of the market (very low ability). Workers consider their employment probability and wage conditional on matching, and move to maximize expected wage. Firms, while unable to observe worker ability prior to the match, can predict average ability level in each sector. Firms enter/exit both markets until expected zero profit holds.[5]

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1 Covered firms conduct business with city governments or in some cases, is the government.

2 This framework applies to any large disparity in wage floors in multiple markets, such as minimum wage in the European Union. As of 2010, Luxembourg has the highest minimum wage at 1683 EUR and Bulgaria has the lowest at 123 EUR, an almost 14-fold difference. (Normalizing purchasing power reduces the difference to 6-fold.)

3 See Brenner (2005) and Neumark and Scott (2003, 2005), among others.

4 While considerable controversy exists (see Neumark and Wascher, 2000), the evidence for strong negative employment effect predicted by traditional economic theory is weak.

5 The jobs considered are primarily low-level service jobs in the fast food industry (minimum wage) or janitorial, cleaning, and home-care industries (living wage).

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How each sector responds to a living wage change depends crucially on which sector had the higher employment probability prior to the policy change. I find that if the covered sector initially had the higher employment probability, a wage floor increase has ambiguous employment effects in the covered sector but increases employment in the uncovered sector. If the covered sector has the lower employment probability, a wage floor increase leads to lower employment levels and probabilities in the covered sector and increased employment levels and ambiguous change in employment probability in the uncovered sector.[6] In both cases, the one segment of the working population that is unequivocally hurt is the low-ability workers originally in the covered sector.

2. The model

There are two sectors. Sector A initially has a higher wage floor compared to Sector B.[7] Workers are risk neutral and differentiated by ability, $\delta_i, \delta \in [0, 1]$. Workers in Sector A (B), numbering N_A (N_B) search for vacancies posted by identical firms in Sector A (B), numbering J_A (J_B).[8] Searching workers sum to $\overline{N}$ and entry by firms is endogenous. As in Pissarides (1992), the number of matches in Sector k is Cobb–Douglas on the interior:

$$x_k = \min\{\gamma J_k^{\alpha} N_k^{1-\alpha}, J_k, N_k\} \tag{1}$$

where $\alpha \in (0, 1)$ and γ is a normalizing constant. Workers (firms) within a sector have the same probability of finding a match, $P_k = x_k/N_k$ ($q_k = x_k/J_k$).[9]

A match generates revenue equal to worker i's ability, δ_i. When wage floor does not bind, the worker receives $\beta\delta_i$, and the firm receives $(1-\beta)\delta_i$, with $\beta \in (0, 1)$.[10] When wage floor binds, the match pays at least $\underline{W}$, such that worker i receives $W_i = \max\{\beta\delta_i, \underline{W}\}$. Workers search in the sector that maximizes expected wage.

Firm expected zero-profit conditions are

$$q_A E(\max\{\min\{(1-\beta)\delta_i, \delta_i - \underline{W}\}, 0\}|A) - C = 0 \tag{2}$$

$$q_B(1-\beta)E(\delta_i|B) - C = 0 \tag{3}$$

where $E(\delta|k)$ is the expected revenue of matching conditional on Sector k. Sector A firms reject matches where $\delta_i < W_i$.[11]

Two initial conditions are considered:

1. $P_A > P_B$.
2. $P_B > P_A$.

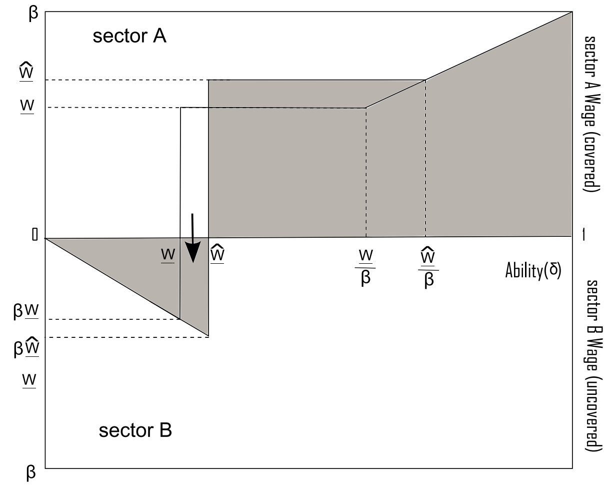

Fig. 1. Distribution of workers and wages when $P_A > P_B$.

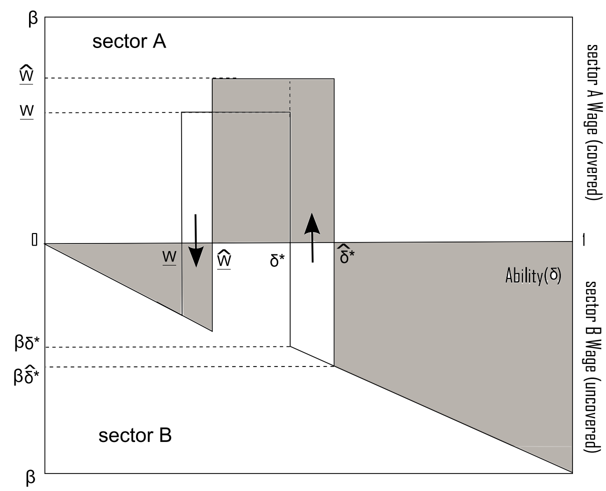

Fig. 2. Distribution of workers and wages when $P_B > P_A$.

2.1. When $P_A > P_B$

When employment probability is higher in the covered sector, all workers except $\delta_i < \underline{W}$ move to Sector A. Workers with ability $\underline{W} < \delta_i < \frac{\underline{W}}{\beta}$ receive $\underline{W}$. All other matched workers receive $\beta\delta_i$. See Fig. 1.

2.2. When $P_B > P_A$

When employment probability is higher in the uncovered sector, all workers except $\underline{W} < \delta_i < \delta^*$ move to Sector B. δ^* represents the worker who is indifferent between Sector A (higher wage and lower employment probability) and Sector B:

$$P_A\underline{W} = P_B\beta\delta^*. \tag{4}$$

See Fig. 2. A sub-game perfect equilibrium exists in $P_A > P_B$ and $P_B > P_A$ scenarios.[12]

Proposition 1. *Given Eqs. (1)–(4), parameter vector* $\{\underline{W}, \overline{N}, C_A, C_B, \beta\}$, *and* $\delta \sim U(0, 1)$ *there exists a unique sub-game perfect equilibrium in* $\{N_A, N_B, J_A, J_B\}$.

Ability should be interpreted broadly to include qualities such as conscientiousness, punctuality, and positive attitude. (See Card and Krueger, 1995 and Chapman and Thompson, 2006.) It seems reasonable that workers know their ability prior to job-match, and firms are able to judge after matching.

6 If workers do not observe their own productivity, the potential positive impacts of sorting by ability level go away, and the primary effect of a wage floor hike in one sector would be a large increase in unemployment due to match rejection by firms.

7 For notational simplicity in the model, I normalize wage floor in Sector B to zero. However, a model in which the two sectors have different wage floors above zero does not qualitatively change the model. There would now be a segment of workers with ability level $\delta_i < \min\{\underline{W}_A, \underline{W}_B\}$, who are unemployable in either sector.

8 Allowing simultaneous search in both sectors and introducing a search effort that must be optimally distributed across the two sectors would leave the qualitative results unchanged (but significantly complicates the model).

9 Qualitative results remain unchanged if higher ability workers are more likely to match.

10 See Ahn et al. (2011) for the rigorous derivation.

11 C, the cost of posting a vacancy, is bounded between $0 < \underline{C} \leq C \leq \overline{C} < 1$ to ensure the existence of both sectors. I also assume $C_A = C_B = C$ for simplicity; however, qualitative results remain unchanged if $C_A \neq C_B$.

12 Proofs of all propositions are at: http://sites.google.com/site/tomsyahn/.