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# Minimum Wages and Firm Training.

**by**

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# Minimum Wages and Firm Training

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**Abstract**

The paper analyzes the influence of minimum wages on firms' incentive to train their employees. We show that this influence rests on two countervailing effects: minimum wages (i) augment wage compression and thereby raise firms' incentives to train and (ii) reduce the profitability of employees, raise the firing rate and thereby reduce training. Our analysis shows that the relative strength of these two effects depends on the employees' ability levels. Our striking result is that minimum wages give rise to skills inequality: a rise in the minimum wage leads to less training for low-ability workers and more training for those of higher ability. In short, minimum wages create a "low-skill trap."

**JEL-Classification:** J24, J31

**Keywords:** Minimum Wage, Firm Training, Skills Inequality

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# 1 Introduction

This paper explores the effect of minimum wages on firms' incentives to provide training for their employees. Our point of departure is a well-known paper by Acemoglu (1997), which argues that a more compressed structure of wages - such as is found in many European countries - gives firms more incentive to train. Acemoglu and Pischke (1999, 2003) view minimum wages as a source of wage compression and show that a rise in the minimum wage stimulates firm training. This result seems simple and compelling: When a minimum wage constraint is binding, a rise in training will increase the productivity of a firm's workforce, but it will not lead to a rise in the wage. Thus training is more profitable under a minimum wage constraint than in the absence of this constraint, for in the latter case the rise in productivity will lead to a wage hike. It is on this account that minimum wages are conducive to training. [1]

This paper considers another potentially important channel whereby minimum wages affect firm training: A rise in the minimum wage reduces the profitability of an employee, thereby making it more likely that the firm will fire the employee. In that case, however, the firm cannot appropriate the gains from training, and thus the firm will provide less of this training.

Whereas the Acemoglu model implies that minimum wages have a positive effect on training, empirical studies typically do not find significant positive or even negative results (e.g. Acemoglu and Pischke (2003), Grossberg and Sicilian (1999), Neumark and Wascher (1998) or Leighton and Mincer (1981)). Acemoglu and Pischke (2003) address this problem through a hybrid model in which an exogenously determined share of all workers are allowed to finance their training by accepting a lower starting wage. If this is prevented by a legal minimum wage, then the resulting fall in training is a second effect

[1] It is worth emphasizing that although workers receiving the minimum wage tend to be low-skilled, they are still widely amenable to training. For example, Freeman and Schekkat (2000) indicate that the low-skilled in Germany tend to be concentrated sectors such as food, care facilities, lumber and wood, and personal services. In all these sectors, productivity can be influenced pervasively through training.

that counteracts the standard effect of wage compression.

This approach to the influence of minimum wages on training has several salient weaknesses - ones that our approach not share. First, the model of Acemoglu and Pischke (2003) is rather ad hoc: the distinction between the two groups of workers is arbitrary and it is not explained why some workers should be “credit-constrained” and others not. Secondly, the notion of financing training via wage cuts does not have clear empirical support (see for instance Loewenstein and Spletzer (1998)).

Furthermore, our model can explain phenomena that the model of Acemoglu and Pischke cannot. Specifically, our model provides a rationale for endogenous "spill-over effects," namely effects on the minimum wage on the training of workers who receive more than the minimum wage. There is empirical evidence for these effects, e.g. Lee (1999), DiNardo, Fortin and Lemieux (1996), Neumark, Schweitzer and Wascher (2004) and Acemoglu and Pischke (2003) find that the minimum wage affects not only the earnings of workers earning the minimum wage, but also the earnings of workers with higher wages. While our model can account for this phenomenon, that of Acemoglu and Pischke cannot.

Finally, our model can explain another previously puzzling empirical regularity. Leighton and Mincer (1981) find that training is lower in states of the U.S. that have wage distributions that are relatively low, where the minimum wage is more likely to be binding.

The paper is organized as follows. In Section 2 we present a simple model of two effects - the "wage compression effect" (whereby minimum wages stimulate firm training) and the "firing effect" (whereby minimum wages raise separations and thereby reduce training) and derive the conditions under which one or the other dominates. This model generates a striking result. For "low-skilled" workers (to be precisely defined below), a *rise* in the minimum wage *reduces* firm training. In short, minimum wages create a "low-skill trap," workers who start out as low-skilled fail to raise their productivity since firms lack the incentive to train them. For workers with higher skills, however, the opposite holds: A rise in the minimum wages leads firms to provide more training to them.

By implication, minimum wages generate inequality in workers' training. The higher the minimum wage, the less training will the low-skilled workers receive and the more the high-skilled workers get. This potentially important implication of minimum wages has not received attention in the labor economics literature thus far. The relevant empirical considerations are covered in Section 3. Section 4 concludes.

# 2 A Simple Model

Let a worker's productivity at a firm be $a+\tau+\varepsilon$; where $a$ is a positive constant, representing worker's intrinsic skills (independent of on-the-job training), $\tau$ is the human capital generated by the firm's on-the-job training; and $\varepsilon$ is a random variable, iid across workers, with single-peaked, symmetric density $g(\varepsilon)$ and constant mean and variance. The random component of productivity is assumed to be firm-specific. It can be interpreted as match-specific shock. At the beginning of a match the firm only knows the general ability $a$ and the human capital $\tau$ of the worker but it does not know how well the worker will "fit" to the firm. This is a standard way to endogenize separations in a matching framework (see for instance Mortensen and Pissarides (1994)). There are constant returns to labor, so that the firm's production function is

$$y = a + \tau + \varepsilon, \tag{1}$$

where $y$ is output per worker. Let the firm's training cost be $c(\tau)$, where $c'(\tau), c"(\tau) > 0$, i.e. the cost rises at an increasing rate with the training provided.

We consider the following sequence of decisions. First, the firm makes its training decision; second, the realized value of the random productivity term $\varepsilon$ is known; third, the firm makes its firing decision, when appropriate; fourth, wage negotiations between the firm and its employees takes place; and finally, production takes place. These steps are illustrated in figure (1)

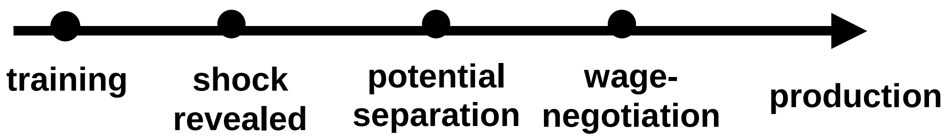


Figure 1: Timing of Events

## 2.1 Wage and Firing Decisions

Wages are determined through Nash bargaining, following the standard practice in the relevant literature. Under agreement, the worker receives the wage $w$ and the firm receives the profit $y - w - c(\tau)$. Under disagreement, the worker receives a zero payoff, whereas the firm still pays the training cost $c(\tau)$. Thus the Nash product is $w^{\mu}(a + \tau + \varepsilon - w)^{1-\mu}$, where $\mu$ (a constant, $0 < \mu < 1$) is the bargaining strength of the worker relative to the firm. Maximizing this Nash product with respect to the wage $w$, we obtain the following negotiated wage:

$$w^n = \mu(a + \tau + \varepsilon) \tag{2}$$

Note that since wages are determined after the random productivity term $\varepsilon$ is known, the distribution of wages across workers depends on the distribution of productivity across workers.

Workers receive the negotiated wage as long as this is above the minimum wage; otherwise they get the minimum wage, i.e. the equilibrium wage is

$$w^* = \max\left(w^n, w^-\right) \tag{3}$$

where $w^-$ is the minimum wage, which is exogenous.

We define the *minimum wage threshold* for the random productivity term $\varepsilon$ as the value of $\varepsilon$ at which the negotiated wage is exactly equal to the minimum wage: $\mu(a + \tau + \varepsilon) =$

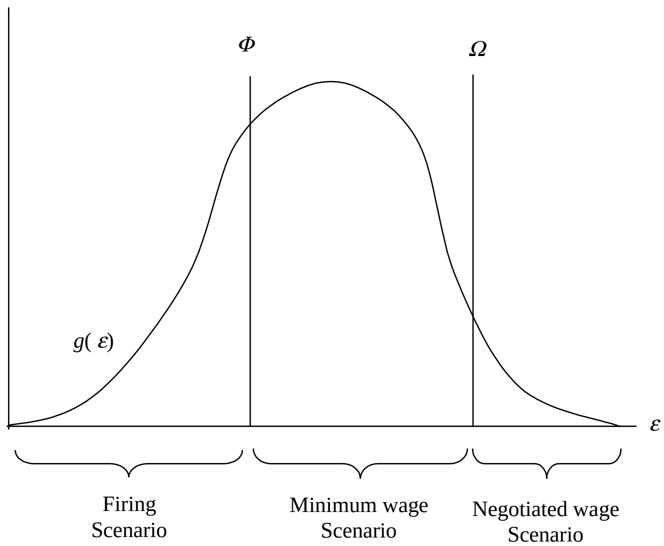


Figure 2: The Wage and Firing Decision

$w^{-}$, so that the threshold value is

$$\varepsilon = \Omega = \frac{w^{-}}{\mu} - a - \tau \tag{4}$$

In other words, if $\varepsilon$ is above this threshold, the worker receives the negotiated wage, and if $\varepsilon$ is below the threshold, the minimum wage is received.

The firm's firing decision depends on whether the worker's productivity term $\varepsilon$ falls short of a particular threshold value. Specifically, a worker is fired when $a+\tau+\varepsilon-w^{*}<0$ (since the training cost is paid regardless of whether firing takes place). Thus the *firing threshold* is

$$\varepsilon = \Phi = w^{*} - a - \tau \tag{5}$$

Observe that the minimum wage threshold lies above the firing threshold: $\Omega > \Phi$. The wage and firing decisions may be illustrated as shown in figure (2).

When the worker's productivity is "low", $\varepsilon < \Phi$, then she is fired. When her productivity is "intermediate", $\Phi < \varepsilon < \Omega$, then she is retained and receives the minimum wage. When her productivity is "high", $\varepsilon > \Omega$, she is retained and receives the negotiated wage.

## 2.2 The Influence of the Minimum Wage on Training

The firm's expected profit is

$$\pi(\tau) = \int_{\Omega}^{\infty} (y - w^n)\, g(\varepsilon) d\varepsilon + \int_{\Phi}^{\Omega} \left(y - w^-\right) g(\varepsilon) d\varepsilon - c(\tau) \tag{6}$$

$$= (1-\mu) \int_{\Omega}^{\infty} (a + \tau + \varepsilon)\, g(\varepsilon) d\varepsilon + \int_{\Phi}^{\Omega} \left(a + \tau + \varepsilon - w^-\right) g(\varepsilon) d\varepsilon - c(\tau) \tag{7}$$

The firm's training decision maximizes its expected profit, so that[2]

$$\frac{\partial \pi(\tau)}{\partial \tau} = (1-\mu) \int_{\Omega}^{\infty} g(\varepsilon) d\varepsilon + \int_{\Phi}^{\Omega} g(\varepsilon) d\varepsilon - c'(\tau) = 0 \tag{8}$$

To derive the influence of the minimum wage on training, we differentiate this condition with respect to the minimum wage and obtain:

$$\frac{\partial^2 \pi(\tau)}{\partial \tau \partial w^-} = \frac{\partial \Omega}{\partial w^-} \beta g(\Omega) - \frac{\partial \Phi}{\partial w^-} g(\Phi) \tag{9}$$

The first right-hand term ($\frac{\partial \Omega}{\partial w^-} \beta g(\Omega)$) is the *wage compression effect*, which may rationalized as follows:

- The firm gains a greater share of the returns from training under the minimum wage than under the negotiated wage: By the training decision (8), we see that the firm reaps the entire returns from training in the minimum wage scenario ($\int_{\Phi}^{\Omega} g(\varepsilon) d\varepsilon$), whereas it reaps only the proportion $(1-\mu)$ of the returns to training in the negotiated wage scenario ($(1-\mu) \int_{\Omega}^{\infty} g(\varepsilon) d\varepsilon$).

[2] To see this, note that

$$\begin{aligned} \frac{\partial \pi(\tau)}{\partial \tau} &= \int_{\Omega}^{\infty} (1-\mu) g(\epsilon) d\epsilon + \int_{\Phi}^{\Omega} g(\epsilon) d\epsilon - \frac{\partial \Omega}{\partial \tau} \left[\Omega + \tau - w\right] g(\Omega) \\ &+ \frac{\partial \Omega}{\partial \tau} \left[\Omega + \tau - w^-\right] g(\Omega) - \frac{\partial \Phi}{\partial \tau} \left(\Phi + \tau - w^-\right) g(\epsilon) - c'(\tau) \\ &= \int_{\Omega}^{\infty} (1-\mu) g(\epsilon) d\epsilon + \int_{\Phi}^{\Omega} g(\epsilon) d\epsilon - \frac{\partial \Omega}{\partial \tau} \left[w - w^-\right] g(\Omega) - \frac{\partial \Phi}{\partial \tau} \left(\Phi + \tau - w^-\right) g(\Phi) - c'(\tau) \end{aligned}$$

Since $w = w^-$ at the minimum wage threshold and $\Phi + \tau - w^- = 0$ at the firing threshold, this simplifies to equation (8).

- A rise in the minimum wage increases the minimum wage threshold, as can be seen from equation (4). This implies that for workers close to the threshold, the firm now can reap all the returns from training. This is what Acemoglu and Pischke (1999) interpret as an increase in wage compression.

- Thus the firm's returns to training - and consequently its incentive to train - increases.

The second right-hand term $(-\frac{\partial \Phi}{\partial w^{-}} g(\Phi)$ is the *firing effect*:

- An increase in the minimum wage reduces the expected profitability of a worker and thus increases the probability that the worker will be fired. In particular an increase in the minimum wage increases the firing threshold (5).

- Thus the firm's returns to training fall. Specifically, prior to the minimum wage increase, the marginal worker received the minimum wage and the firm consequently appropriated the entire returns from training. After the minimum wage increase, the marginal worker is fired and thus the firm naturally receives no returns from training. Due to the assumption of exogenous separations in Acemoglu and Pischke (1999) this effect is ruled out in their model.

These considerations lead to a striking result:

**Proposition 1** ***The training effect of the minimum wage****: If the worker's probability of being at the firing threshold exceeds the probability of being at the minimum wage threshold ($g(\Phi) > g(\Omega)$), then the firing effect dominates, i.e. a rise in the minimum wage leads to less training.*

*Conversely, if the probability of being at the minimum wage threshold exceeds the probability of being at the firing threshold ($g(\Omega) > g(\Phi)$), then the wage compression effect dominates, i.e. a rise in the minimum wage leads to more training.*

To see this, substitute the threshold equations (4) and (5) into the training effect of the minimum wage (9), which yields:

$$\frac{\partial^2 \pi(\tau)}{\partial \tau \partial w^-} = g(\Omega) - g(\Phi) \tag{10}$$

The intuition is straightforward. If the probability of being at the firing threshold ($g(\Phi)$) is greater than the probability of being at the minimum wage threshold ($g(\Omega)$), then a marginal rise in the minimum wage will destroy more incentives than it creates. The increase in turnover outweighs the increased probability that the minimum wage is binding.

It might seem surprising that the densities of both thresholds get the same "weight" in equation (10) even though the effect of the minimum wage on the minimum wage threshold is larger than its effect on the firing threshold. The reason for this lies in the fact, that the firm only gains a share $\beta$ of the returns to training when the minimum wage threshold increases (it already got $(1 - \beta)$ and now it gets the whole return), whereas it looses the whole return when the firing threshold is increased.

Conversely, if $g(\Omega) > g(\Psi)$, then the effect of the minimum wage on the marginal decision to pay the minimum wage will exceed its effect on marginal firing decision. Then the firm can appropriate more of the returns to training and thus it provides more training.

## 2.3 Heterogeneous Abilities

Next, consider the implications of heterogenous abilities on the training effect of the minimum wage. Specifically, let workers differ in terms of the productivity component $a$. This component is independent of training and thus may be interpreted in terms of workers' innate abilities.

Note that a change in ability $a$ shifts both the minimum wage threshold and the firing threshold by the same amount (by the threshold equations (4) and (5)). Thus, for workers of low ability, both thresholds are high relative to the mean of the given

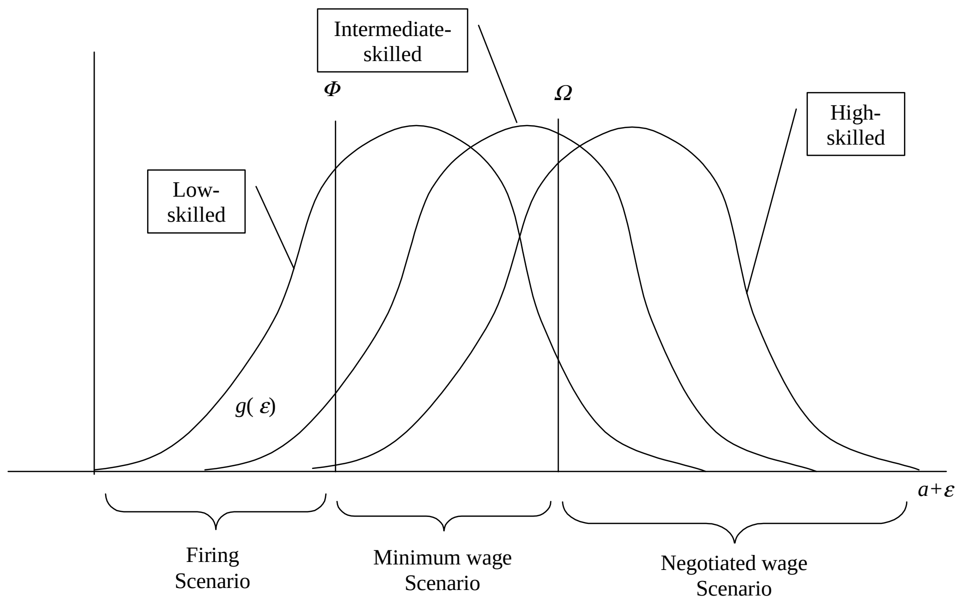


Figure 3: The three different Skill Classes

productivity distribution $g(\varepsilon)$; whereas for workers of high ability, the thresholds are low relative to this mean.

It is useful to distinguish three groups of workers:

- we define workers as being "low-ability" when $g(\Phi) > g(\Omega)$;
- workers are of "intermediate ability" when $g(\Phi) < g(\Omega)$ and $g'(\Phi) > g'(\Omega)$; and
- workers have "high ability" when $g(\Phi) < g(\Omega)$ and $g'(\Phi) < g'(\Omega)$.

Accordingly, the workers depicted in figure (2) are low-ability. Figure (3) illustrates one worker of each skill class.

**Proposition 2** ***Skills inequality***: *For low-ability workers (for whom $g(\Phi) > g(\Omega)$), a rise in the minimum wage leads to less training.*

*For intermediate-ability and high-ability workers (for whom $g(\Phi) < g(\Omega)$), a rise in the minimum wage leads to more training.*

*For workers with intermediate ability, the positive effect of the minimum wage increases with ability.*

*In this sense, minimum wages magnify the inequality in skills.*

The first two points of the proposition follow directly from equation (10) and proposition 1. The third one is proved by differentiating equation (10) with respect to ability: $(\partial^3 \pi(\tau)) / (\partial \tau \partial w^- \partial a) = -g'(\Omega) + g'(\Phi)$.

This equation illustrates the effect of ability on the minimum wage effect and is positive for low and intermediate-skilled workers by definition. Only for high-skilled workers the equation is negative and illustrates the diminishing importance of the minimum wage for high-skilled workers, which is perfectly plausible.

This is another striking result: In response to a rise in the minimum wage, firms have less incentive to provide training to low-ability workers, and their expected productivity $(a + \tau)$ falls even further. On the other hand, firms gain more incentive to provide training to intermediate-ability workers, raising their expected productivity further. In short, the segmentation of the labor market in terms of skills becomes more pronounced.

# 3 Empirical Considerations

## 3.1 A Numerical Example

In our numerical example, we have assumed that the idiosyncratic shock is normally distributed, with zero mean and a standard deviation equal to 0.75, which implies a firing rate of 7.5% for the whole population. This value is in accordance with the results of Wilke (2004).[3] The bargaining power of workers is assumed to be 0.5. The results of

[3]The choice of the standard deviation does only matte quantitatively, as a sensitivity analysis further below will show.

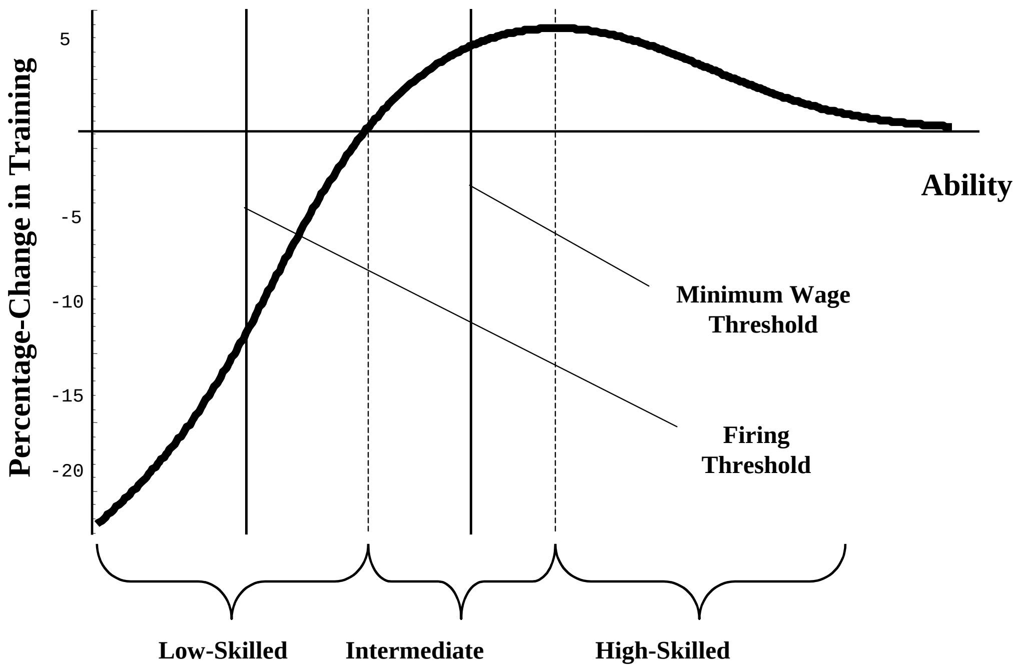


Figure 4: Effect of Change in Minimum Wage on Training

Proposition 2 are illustrated in figure (4) which shows, for workers of differing abilities $a$ (in our production function (1)), the changes in training investments that follow from an increase in the minimum wage by 10%. Observe that low-skilled workers suffer a decrease in training investments, while all other workers receive more training. Thus, we are able to explain the empirical evidence discussed in the introduction, namely that minimum wages decrease training.

The picture also illustrates another interesting result that follows from the third point in Proposition 2: Among intermediate-skilled workers, those with higher ability get more training even if their average productivity is above the minimum wage threshold. This so called "spillover effect" might seem surprising, but is explained by the fact that these workers are relatively unlikely to fall below the firing threshold. However, they are still close to the minimum wage threshold and therefore the positive effect on training is present. To the contrary, workers in the highest skill class are so productive that the minimum becomes progressively less important as skills increase.

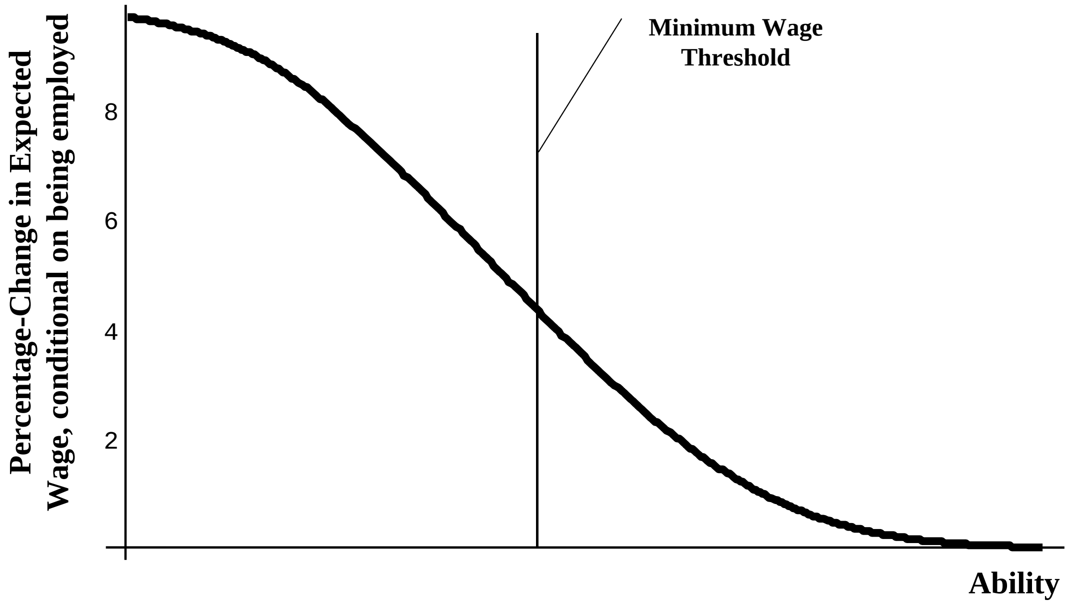


Figure 5: Effect of Change in Minimum Wage on Expected Wages

## 3.2 The influence of the Minimum Wage on Wages and Income

Note that the spillover effect of the minimum wage on the human capital of intermediate-ability workers explains the associated spillover effect on wages. This spillover effect is a phenomenon that is very well supported by the empirical evidence on the distributional consequences of minimum wages (see for instance Grossberg and Sicilian (1999), Neumark et al. (2004) or Leighton and Mincer (1981)). Figure (5) illustrates the effects of a 10%-increase in the minimum wage on expected wages, conditional on being employed.

Observe that for all workers the increase in expected wages is lower than the increase in the minimum wage by 10%. This is due to the fact, that even workers with very low ability have the chance to earn wages above the minimum wage in case their idiosyncratic shock was sufficiently positive. In these cases, the wage will decline due to the minimum-wage-induced falls in human capital, as illustrated in figure (6) which shows how he wage of a worker with a certain ability $a$ depends on the idiosyncratic shock $\varepsilon$. It is on this

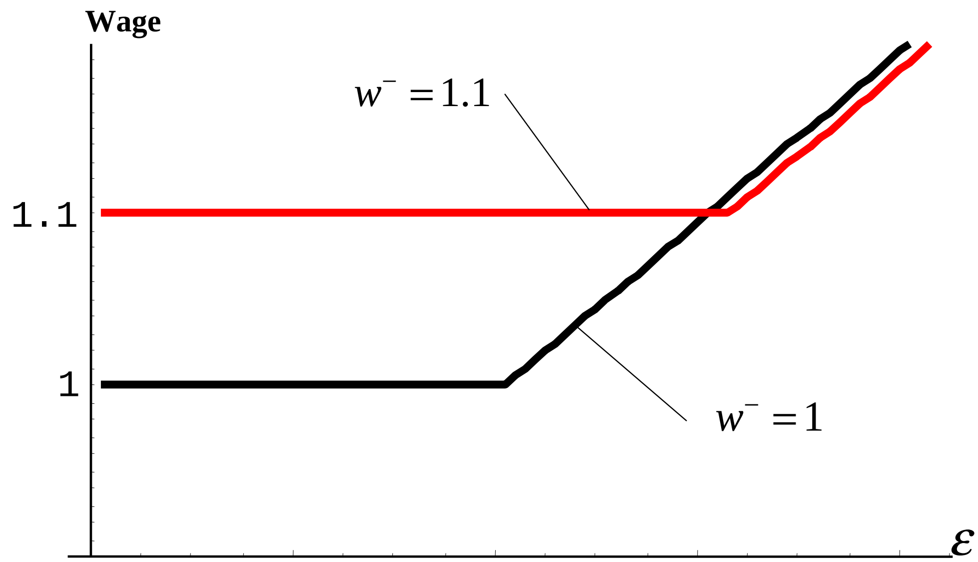


Figure 6: Wage in Dependence of Idiosyncratic Shock for a Low-Skilled Worker

account that the expected wage will rise by less than the 10% increase in the minimum wage.

Finally, figure (7) illustrates the effects of an increase in the minimum wage on expected wage-income.[4] Although, low-skilled workers earn more, given that they have a job (as shown in figure (5)), the unconditional expectation is lowered, since both the chances to keep a job and training decrease. *Thus the minimum wage does not only increase the inequality in firm training but also the inequality in expected wage income.* This phenomenon again receives support from the empirical literature, as for instance in Neumark et al. (2004).

### 3.3 An Application to German Data

To make a rough assessment of how important these effect are, we have used the distribution of wages in Germany in order to estimate how many workers would be low-skilled

[4]Note that the wage in figure (5) was conditional on being employed while the wage in this figure is not.

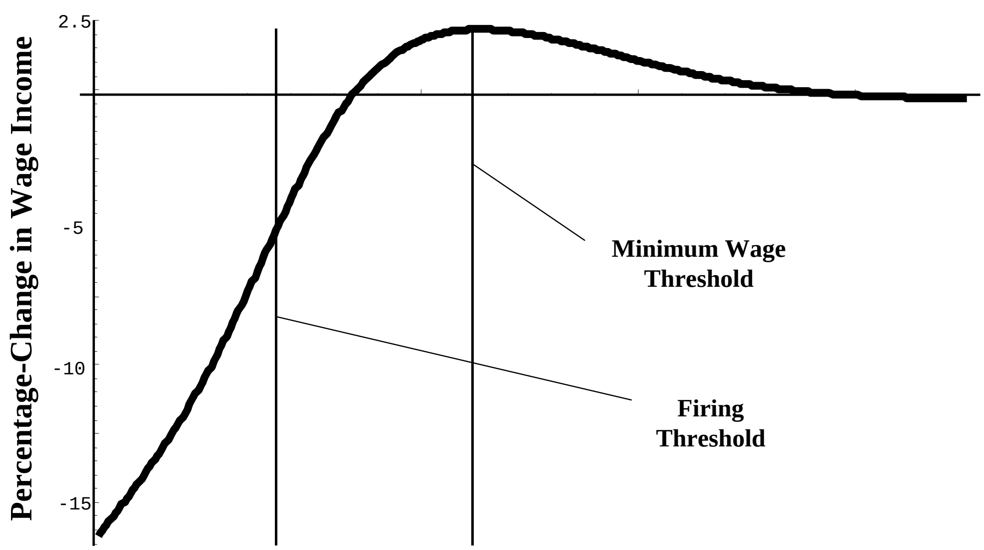


Figure 7: Effect of Minimum Wage on Wage Income

or intermediate-skilled according to our definition. Using the data in Statistisches Bundesamt (2005) we have calculated 1862 Euro as the mean and 1388 Euro as the standard deviation of wages. Introducing a minimum wage of 50% of the average wage (as for instance in France, see Funk and Lesch (2005)) would imply that 12.3% of employed workers earn the minimum wage - this is pretty close to the 13% of affected workers in France. 11.7% of total workers (including those who are unemployed) are "low-skilled" according to our definition, while 11.9% are "intermediate-skilled" and the remaining 76.4% are "high-skilled".

Using the wage-distribution to calculate the weighted average of changes in training after an increase in the minimum wage by 10%, we find that low-skilled workers receive on average 11.3% less training. Intermediate-skilled workers gain 4.1% and high-skilled workers just above 1%. For the group of workers receiving the minimum wage (which consists of all the low-skilled and some of the intermediate-skilled workers) it is still a remarkable training loss of 5.5%. Although almost 90% of the population either receive more training or are basically unaffected, the average for the whole population is negative but very close to zero (-0.06%). This due to the large losses of the low-skilled workers.

Table 1: Effect of Minimum Wage Change on Training and Wages per Skill-class

| Skill-class | Change in Training | Change in Wage |
|---|---|---|
| low | -11.3% | -7% |
| intermediate | 4.1% | 2.2% |
| high | 1% | 0.25% |
| earning minimum wage | -5.5% | -3.3% |
| whole population | -0.06% | -0.36% |

Table (1) summarizes these results.

The same exercise can be repeated for expected wage income. We find that on average a low skilled worker suffers a decrease in expected wage income of 7% while intermediate skilled workers gain 2.2% and high skilled workers 0.25%. Workers whose ability lies at or below the minimum wage threshold loose 3.3% in income. The total for the whole population is negative but again close to zero (-0.36%).

### 3.4 Sensitivity Analysis

There is one parameter in our numerical examples that is potentially important and whose calibration is open to question: the standard deviation of the idiosyncratic shock. The value of 0.75 was chosen to match a certain firing-rate for the whole population. However, since the simple structure of our model implies that high-skilled workers aren't fired, this approach gives at best a broad approximation for the variability of the shock. In this section we thus show how our quantitative results depend on the choice of this parameter. Our qualitative results remain unchanged. We choose standard deviations of 0.5 and 1 and compare these with the results of the previous section.

Figure (8) shows that the reactions to an increase in the minimum wage are more extreme for less volatile shocks, but the basic structure of the response is the same in

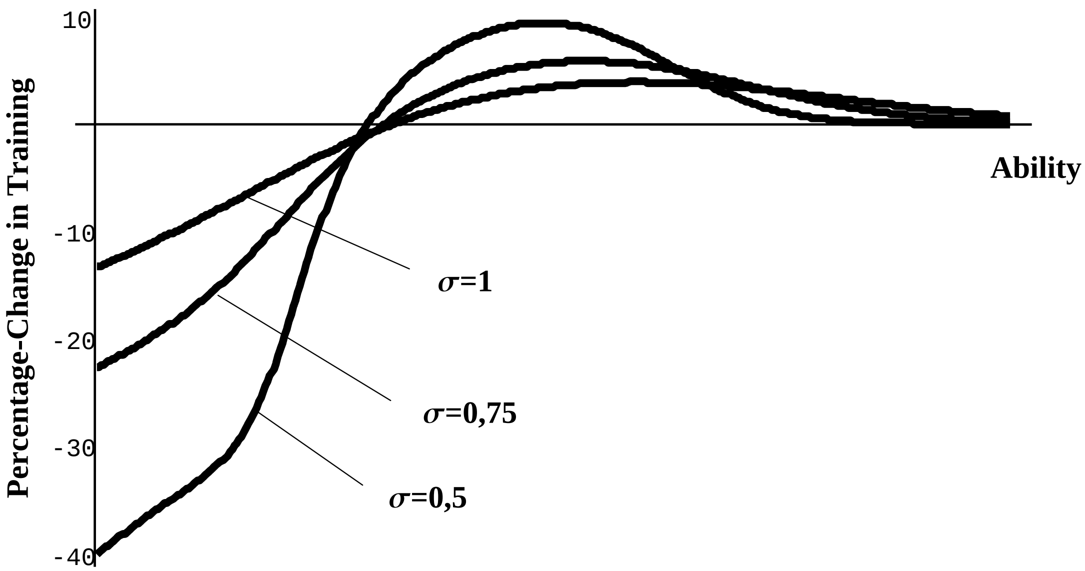


Figure 8: Change in Training for different Standard Deviations

all three cases. That the results are more extreme for lower standard deviations is due to the fact, that then workers' productivity is more closely associated with their ability. Therefore a worker close to the firing threshold will be fully affected by the negative effect of the minimum wage but has a low chance of profiting from the positive effect (technically $g(\Phi)$ is high while $g(\Omega)$ is low). If the volatility of the shock increases, the chances of gaining from the positive effect increase ($g(\Phi)$ is still high but $g(\Omega)$ increases). Therefore the loss in training becomes smaller as can be inferred from figure (8). For intermediate skilled workers it is exactly the other way around: A smaller volatility of the idiosyncratic shock implies a lower risk of being affected by the negative effect of the minimum wage and therefore a higher amount of training.

Finally, we repeat our exercise of evaluating a change in the minimum wage by using data on the wage-distribution in Germany to calculate how the skill classes are affected on average. Table (2) compares the results with those further above and strengthens our claim, that the volatility of shocks is not important qualitatively.

Table 2: Effect of Minimum Wage Change for different Standard Deviations

| Skill-class | Change in Training (in%) | | | Change in Wage (in%) | | |
|---|---|---|---|---|---|---|
| | $\sigma = 0.5$ | $\sigma = 0.75$ | $\sigma = 1$ | $\sigma = 0.5$ | $\sigma = 0.75$ | $\sigma = 1$ |
| low | -23.3 | -11.3 | -6 | -17.8 | -7 | -3.1 |
| intermediate | 6.5 | 4.1 | 4.1 | 4.23 | 2.2 | 1.2 |
| high | 1.1 | 1 | 0.9 | 0.28 | 0.25 | 0.2 |
| earning minimum wage | -10.6 | -5.5 | -3 | -8.2 | -3.3 | -1.5 |
| whole population | -0.98 | -0.06 | 0.33 | -1.28 | -0.36 | -0.05 |

# 4 Conclusion

Our model sheds light on the results of the empirical findings concerning the relationship of minimum wages and firm training. In the standard model of Acemoglu (1997), minimum wages increase training, whereas empirical studies typically find negative or insignificant effects. We endogenize job separations and show that the associated "firing effect" on minimum wages on training counteracts the standard wage compression effect: whereas increased wage compression encourages training, the increased firing probability discourages training.

Our analysis indicates that the relative strength of these effects depends on the ability levels of the employees. The relationship between ability and the minimum wage effect is non-linear: Workers of low ability will suffer losses in human capital, while workers with intermediate ability gain (the "spillover effect" of the minimum wage on training). Workers of high ability also get more training but the effect converges towards zero with ability.

This spillover effect accounts for another empirical regularity, namely that the effect of the minimum wage affects the wages of workers earning more than the minimum wage (see for instance Lee(1999)). This effect cannot be explained by the model of Acemoglu and Pischke (2003). Additionally, our model can give a plausible explanation for the result in Leighton and Mincer (1981) that U.S.-states with relatively low skills, and thus relatively more pervasively binding minimum wages, have lower training.

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