

# LECTURE 17

# MATCHING | WAGES

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# WAGES

- we have seen that in the matching model of unemployment
  - labor supply depends on labor market tightness
  - labor demand depends on labor market tightness and wage
- to determine the equilibrium of the matching model, we need to know the wages that firms pay to workers
- we consider several theories of wage setting (reality is probably a mix of these theories – depends a lot on the sector considered)
  1. wages determined by bargaining between union and firm
  2. wages determined by labor-market institutions (minimum wage)
  3. efficiency wages
  4. wages determined by bargaining between firm and worker (Nash bargaining)

# UNION MEMBERSHIP IN THE US

## Union membership selected years

year	percent of labor force
1930	12.0
1945	35.0
1954	35.0
1970	27.0
1983	20.1
2013	11.3

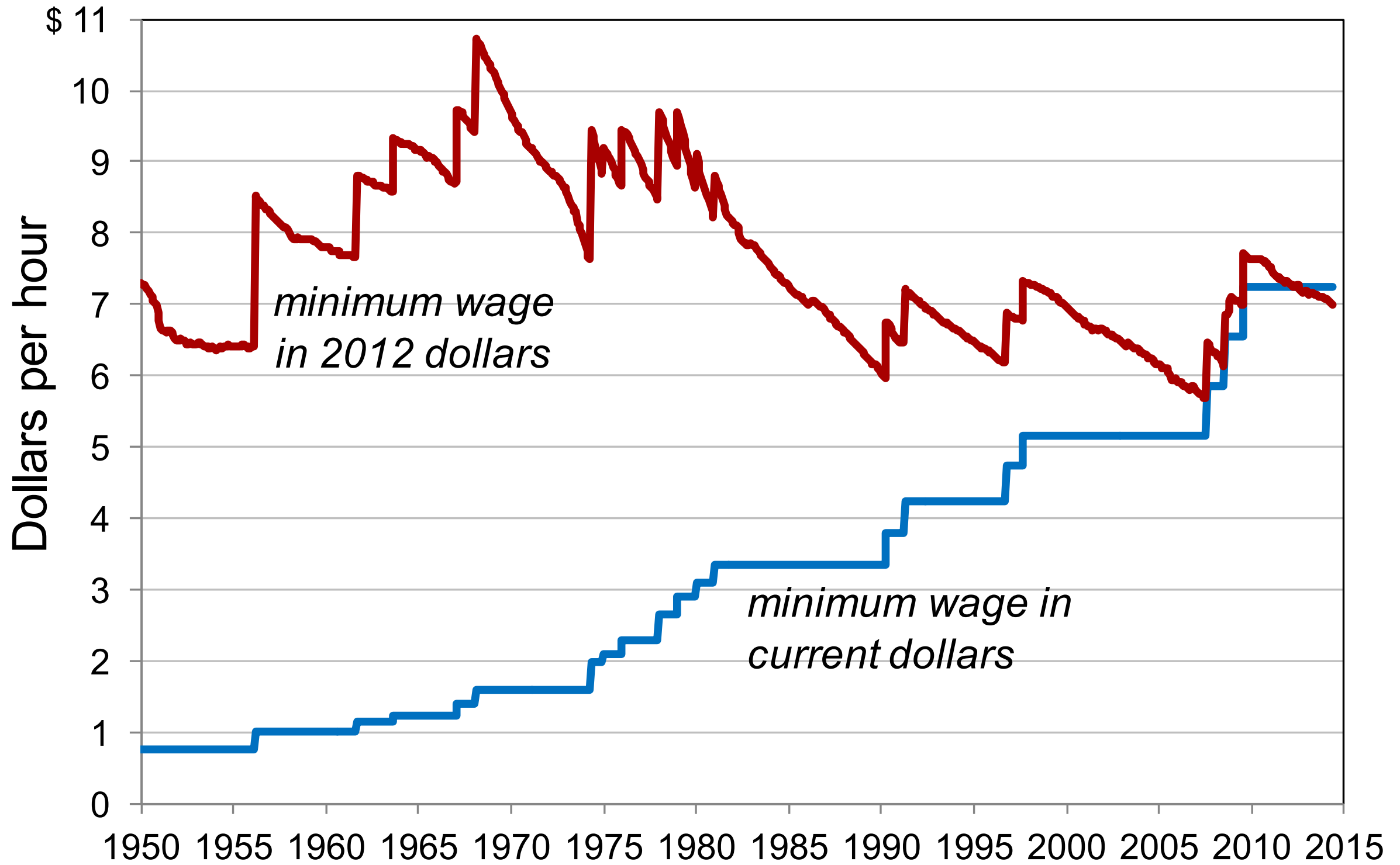
- unions started after WWI to provide better conditions for workers and balance the power of firms
- union membership peaked in 1950 and has been declining since then

# UNION WAGES IN THE US

<i>industry</i>	<i># employed (1000s)</i>	<i>U % of total</i>	<i>wage ratio</i>
Private sector (total)	104,737	6.9	122.6
Government (total)	20,450	37.0	121.1
Construction	6,244	14.0	151.7
Mining	780	7.2	96.4
Manufacturing	13,599	10.5	107.2
Retail trade	14,582	4.9	102.4
Transportation	4,355	20.4	123.5
Finance, insurance	6,111	1.1	90.2
Professional services	12,171	2.1	99.1
Education	4,020	13.0	112.6
Health care	15,835	7.5	114.9

*wage ratio = 100 × (union wage) / (nonunion wage)*

# THE MINIMUM WAGE



# EFFICIENCY WAGES

- efficiency-wage theories postulate that higher wages make workers more productive: **firms trade off the additional cost from a higher wage with the additional productivity provided by the high wage**
- 1) higher wages increase employees' physical wellbeing (they can afford better living conditions) and hence their productivity
- 2) higher wages increase employees' morale: their commitment to the firm, their sense of duty toward the firm, and hence their productivity (gift exchange)

# EFFICIENCY WAGES

- 3) higher wages reduce turnover
  - higher wages make the firm more attractive compared to other firms: they reduce the incentives to quit and increase the stability of the workforce
- 4) higher wages reduce shirking
  - when workers shirk, there is a chance that the firm catches them and lays them off
  - higher wages make it very costly for workers to lose their jobs: they reduce shirking and thus increase productivity

# EFFICIENCY WAGES: FORD

Annual Turnover and Layoff Rates (%) at Ford, 1913–1915

	1913	1914	1915
Turnover rate	370	54	16
Layoff rate	62	7	0.1

- in 1914, Henry Ford announced that his company would pay a minimum of \$5 a day for an eight-hour day, compared to an average of \$2.30 for a nine-hour day previously
- “There was no charity involved. We wanted to pay these wages so that the business would be on a lasting foundation. We were building for the future. A low wage business is always insecure. The payment of five dollars a day for an eight hour day was **one of the finest cost cutting moves we ever made.**” Ford, *My Life and Work*, 1922.



# EFFICIENCY WAGES: WALMART

- <https://www.nytimes.com/2016/10/16/upshot/how-did-walmart-get-cleaner-stores-and-higher-sales-it-paid-its-people-more.html>
- “Shoppers were fed up. They complained of dirty bathrooms, empty shelves, endless checkout lines and impossible-to-find employees. Only 16 percent of stores were meeting the customer service goals.”
- “In early 2015, Walmart announced it would actually pay its workers more. That set in motion the biggest test imaginable of a basic argument: What if paying workers more, training them better and offering better opportunities for advancement can actually make a company more profitable, rather than less?”
- “It is an idea that flies in the face of the prevailing ethos on Wall Street and in many executive suites the last few decades. But there is sound economic theory behind the idea. **Efficiency wages is the term that economists use for the notion that employers who pay workers more than the going rate will get more loyal, harder-working, more productive employees in return.**”

# EFFICIENCY WAGE: WALMART

- “Walmart said it would raise its hourly pay to a minimum of \$10 for workers who complete a training course and raise department manager pay to \$15 an hour, from \$12. It said it would offer more flexible and predictable schedules to hourly workers.”
- “Walmart says its average pay for a full-time nonmanagerial employee is now \$13.69 an hour, up 16 percent since early 2014.
- “So, 19 months in, what is Walmart finding? Those customer surveys that were so terrible at the start of 2015 have improved, with “clean, fast, friendly scores” rising for 90 consecutive weeks. Surveys by outside groups point to more satisfied customers as well. At stores open at least a year, sales were up 1.6 percent over a year earlier in the most recent quarter.”

# FIRM-WORKER BARGAINING

- the firm and worker bargain together over a wage
  - in the US: 30% of workers bargain
  - mostly for highly paid / highly educated employees
- different from collective bargaining: bargaining between unions and firms
  - 10% of US workers' wages are set by collective bargaining
  - more important in Europe and Japan

# GENERAL PROPERTIES OF A BARGAINED WAGE

- the bargained wage splits the surplus from a worker-firm match between worker and firm according to their bargaining power
- the wage is higher when workers have more bargaining power
- the wage is higher when the value of a match to the firm is higher
  - more productive workers
- the wage is higher when workers have better outside options
  - higher labor market tightness (easy to find another job)
  - higher unemployment insurance (not too bad to reject job offer)

# EXAMPLE: WAGE FROM NASH BARGAINING

- the productivity of a producer is  $a > 0$
- the value of being unemployed is  $z$ 
  - $z$  could be positive: time for leisure, education, home production
  - $z$  could be negative: loss of human capital, lower physical and mental health
- the bargaining power of the worker is  $\beta$  and the bargaining power of the firm is  $1 - \beta$ 
  - bargaining powers are between 0 and 1, and taken as given
- the surplus from a worker-firm match is  $a - z$ 
  - the surplus is split between worker and firm

# COMPUTING THE NASH BARGAINED WAGE

- the firm gains  $a - W > 0$  from matching
- the worker gains  $W - z > 0$  from matching
- with Nash bargaining: the wage  $W$  maximizes  $(a - W)^{1-\beta} \times (W - z)^\beta$ 
  - $\max. \ln[(a - W)^{1-\beta} \times (W - z)^\beta] = (1 - \beta) \times \ln(a - W) + \beta \times \ln(W - z)$
- take the derivative with respect to  $W$  to find the maximum:
  - $0 = -(1 - \beta)/(a - W) + \beta/(W - z)$
  - $(1 - \beta) \times (W - z) = \beta \times (a - W)$
- thus the Nash bargained wage is:  $W = \beta \times a + (1 - \beta) \times z$
- the wage is higher when productivity is higher, bargaining power  $\beta$  is higher, and outside option  $z$  is higher



# MODELING WAGES IN PRACTICE

- can model wages using unions, minimum wage, efficiency wage theories, or bargaining theories
- **rigid wage**: wage that does not respond to tightness or productivity
- **flexible wage**: wage that responds a lot to tightness or productivity
- some of these approaches yield very rigid wages
  - unions, minimum wage, efficiency wages based on well-being or morale
- some of these approaches yield very flexible wages
  - bargaining, efficiency wages based on based on turnover or shirking
- **in practice, wages are very rigid: we model the wage as a parameter  $W < a$**