

## Chapter 13: Labor Markets, Poverty, and Income Distribution

### A. Demand for labor



Joe's Muffler Shop

- Inputs:
- building
  - tools
  - utilities
  - labor



- Output:
- number of mufflers replaced



- Joe's shop gets: \$100 for each muffler replaced
- Question: take building, tools, and utilities fixed, vary labor

Number of workers	Output (mufflers per day)
1	5
2	8
3	9



#### Definitions:

The *marginal product of labor* is how much output would increase from hiring one more worker

The *value of marginal product* is how much revenue would increase from hiring one more worker

Number of workers	Output (mufflers per day)		
1	5		
2	8		
3	9		

Number of workers	Output (mufflers per day)	Marginal product (mufflers per worker)	
1	5	5	
2	8	3	
3	9	1	

Number of workers	Output (mufflers per day)	Marginal product (mufflers per worker)	Value of marginal product (\$ per worker)
1	5	5	\$500
2	8	3	\$300
3	9	1	\$100

Definition:  
 The tendency of the marginal product of labor to fall as the number of workers hired increases is referred to as *diminishing returns to labor*

Number of workers	VMP (\$ per worker)
1	\$500
2	\$300
3	\$100

- If Joe had to pay each worker \$200/day, he would want 2 but not 3 employees
- If Joe had to pay each worker \$100/day, he would want 3 employees

Proposition: A profit-maximizing firm would hire labor up to the point where VMP equals the wage

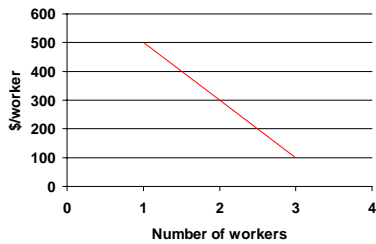
Note this is a special case of the general principle of setting marginal benefit equal to marginal cost

Marginal benefit of hiring one more worker = VMP

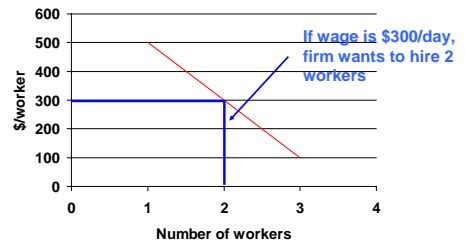
Marginal cost of hiring one more worker = wage

MB = MC requires VMP = W

## Value of marginal product



## Value of marginal product

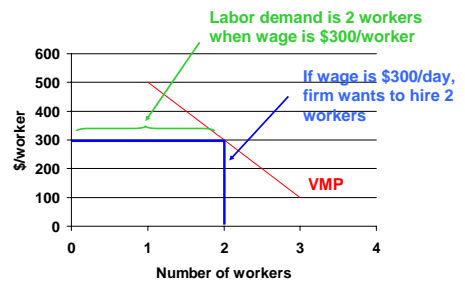


We can read firm's demand for labor off the VMP schedule

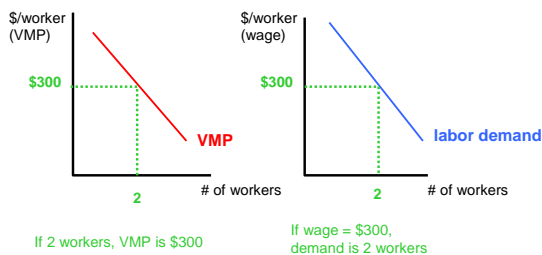
Summary: how to calculate firm's demand for labor

- Calculate how much output goes up by hiring one more worker (=MP)
- Calculate what this is worth in dollars to the firm (=VMP)
- Find largest number of workers for which VMP is greater than or equal to the wage
- This is the number of workers the firm wants to hire

On a graph, labor demand is the horizontal distance out to VMP schedule



Conclusion: VMP and labor demand are just two names for the same curve



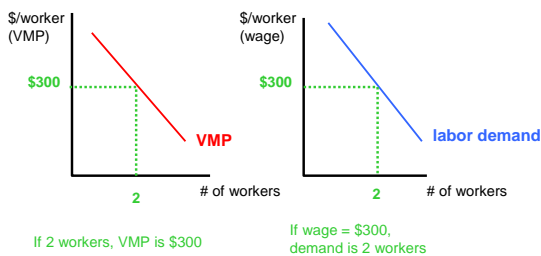
## Chapter 13: Labor Markets, Poverty, and Income Distribution

### A. Demand for labor

VMP = additional revenue to firm from hiring one more worker

Proposition: A profit-maximizing firm would hire labor up to the point where VMP equals the wage

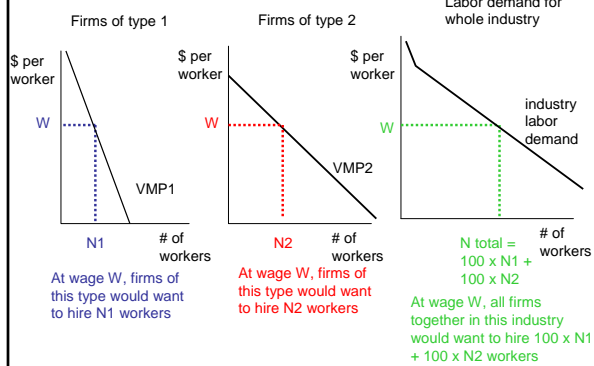
Conclusion: VMP and labor demand are just two names for the same curve



## Chapter 13: Labor Markets, Poverty, and Income Distribution

- A. Demand for labor
- B. Firm versus industry labor demand

Industry-wide labor demand is horizontal summation of each individual firm's VMP schedule



## Chapter 13: Labor Markets, Poverty, and Income Distribution

- A. Demand for labor
- B. Firm versus industry labor demand
- C. Supply of labor

Could ask three different questions:  
How many people would be willing to work for a given wage:

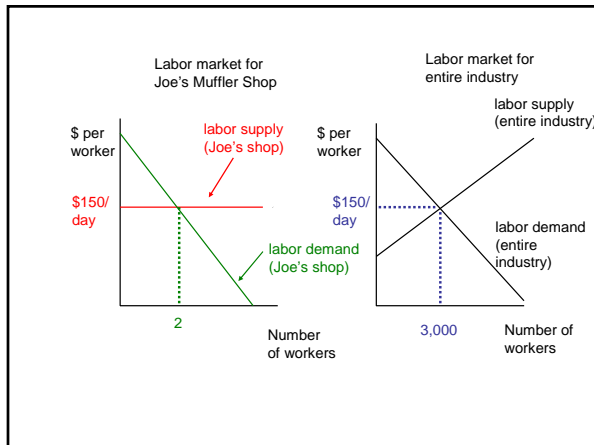
- at this particular firm? (gives us firm's supply of labor)
- in this industry? (gives us industry's supply of labor)
- in the entire economy? (gives us economy-wide supply of labor)

Perfect competition in the labor market:

- There are a large number of firms in this industry
- Workers don't care which firm they work at
- All workers have the same productivity

Implications:

- All firms in this industry must pay the same wage
- The individual firm's supply of labor looks flat from point of view of the firm



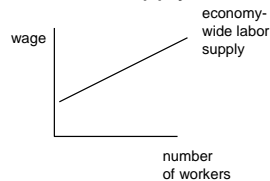
Labor supply curve for one industry: raise wage in this industry, holding wages in other industries constant

Labor supply for entire economy: raise wage in all jobs, what would happen to number of people who want jobs?

### Substitution effect

One possibility: some people are attracted into labor force who wouldn't otherwise want to work

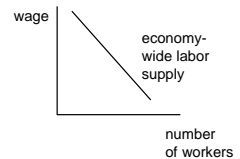
In this case, economy-wide labor supply curve would slope up



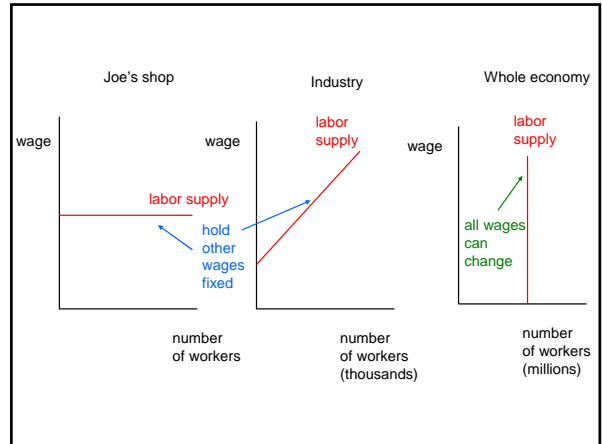
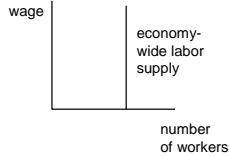
### Income effect

Another possibility: if one member of couple earns more money, the other might feel he or she doesn't need to work (or each worker puts in fewer hours)

In this case, economy-wide labor supply curve would slope down



Unclear (from both theory and evidence) which effect dominates  
 Assumption for some simple illustrations: income and substitution effects exactly cancel out (vertical labor supply)



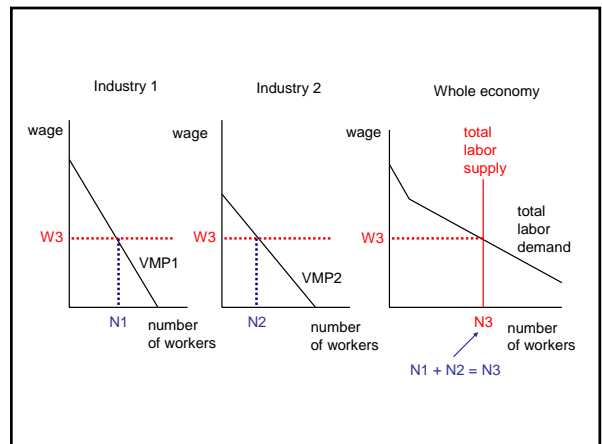
### Chapter 13: Labor Markets, Poverty, and Income Distribution

- A. Demand for labor
- B. Firm versus industry labor demand
- C. Supply of labor
- D. Determinants of wages

To represent what goes on in the economy as a whole, let's assume that there are only two industries in the economy as a whole

### Chapter 13: Labor Markets, Poverty, and Income Distribution

- A. Demand for labor
- B. Firm versus industry labor demand
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- D. Determinants of wages
  1. Wages when all people have same abilities and same interests and all jobs look alike



Conclusion:

If everybody had the same ability and same interests and all jobs were equally attractive, then economic theory predicts that everybody would receive the same wage

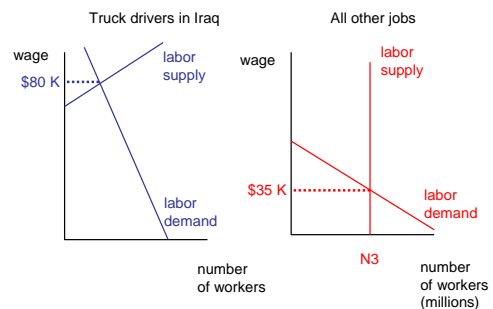
## Chapter 13: Labor Markets, Poverty, and Income Distribution

### D. Determinants of wages

1. Wages when all people have same abilities and same interests and all jobs look alike
2. Wages when some people are unable or unwilling to do certain jobs

A U.S. truck driver might make \$35,000 per year

If you're willing to drive it in Iraq, you could make \$80,000



Definition:

A *compensating wage differential* is a difference in the wage rate that reflects the attractiveness of a job's working conditions

Truck drivers in Iraq receive a positive compensating wage differential

A compensating wage differential can be negative if people would want that job even if it pays less than others.

Examples:

- median income of dancers is \$21,000
- median income of zoo workers is \$16,500

Some jobs may require skills that many people do not have, or effort that many are unwilling to commit

The average 30-year-old college graduate earns \$15,000 more per year than high-school graduate

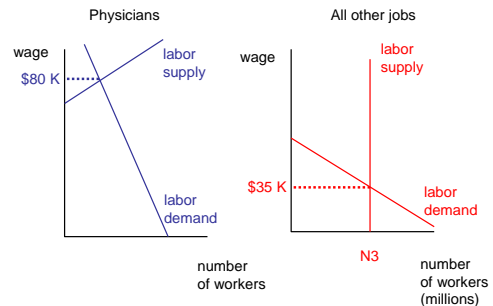
The average 55-year-old college graduate earns \$30,000 more per year



Definition:

**Human capital** refers to the combination of education, experience, training, intelligence, energy, work habits, trustworthiness, and initiative, that may determine an individual's VMP.

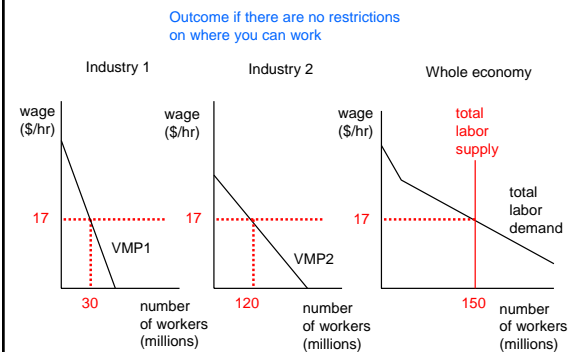
Some economists believe that most differences in wages can be attributed to differences in human capital



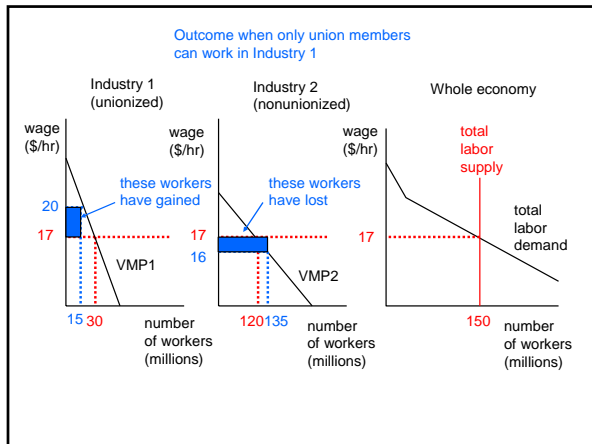
## Chapter 13: Labor Markets, Poverty, and Income Distribution

### D. Determinants of wages

1. Wages when all people have same abilities and same interests and all jobs look alike
2. Wages when some people are unable or unwilling to do certain jobs
3. Wages when some people are restricted from doing certain jobs







**Winners:**

- union members who stay employed

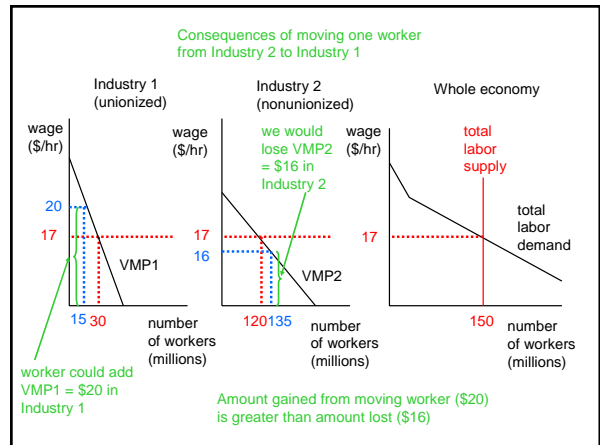
**Losers:**

- union members who lose their jobs
- non-union members
- firms in union sectors

Can we compare total dollar value for each?

Outcome is socially inefficient because too few people are now working in union sector

Take 1 worker from nonunion sector and put on union job



**Chapter 13: Labor Markets, Poverty, and Income Distribution**

D. Determinants of wages

1. Wages when all people have same abilities and same interests and all jobs look alike
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E. Discrimination

**Chapter 13: Labor Markets, Poverty, and Income Distribution**

D. Determinants of wages

1. Wages when all people have same abilities and same interests and all jobs look alike
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E. Discrimination

Median Weekly Earnings:

white men: \$747  
white women: \$589  
black men: \$529  
black women: \$512

Source: BLS, "Usual Weekly Earnings"

Could such differences be explained by differences in human capital or work preferences?

Fraction of population with bachelor's degree or higher:

whites: 27.6%  
blacks: 17.3%

Source: US Census Bureau, *Educational Attainment in the United States: 2003*

Average hours worked per week:

men: 41.6  
women: 35.9

Source: BLS, "Characteristics of the Employed"

However, some differences persist even when we compare people of same observable characteristics

Some economists argue that this is just because many of the differences in human capital or preferences for type of work are not measured accurately

Suppose there were two different workers who would contribute the same VMP to the firm, but one would cost the firm 20% less than the other.

Then the firm could make more money by hiring the cheaper worker to do the same job.

Implication: pure discrimination (paying a higher wage to someone who is no better qualified because they are in a favored group) would not be in the economic interests of a firm

So how could we explain the existence of discrimination?

(1) ignorance– firm doesn't know it would make more profits if it didn't discriminate

But if that's the explanation, wouldn't smart firms come in and drive the ignorant people out of business?

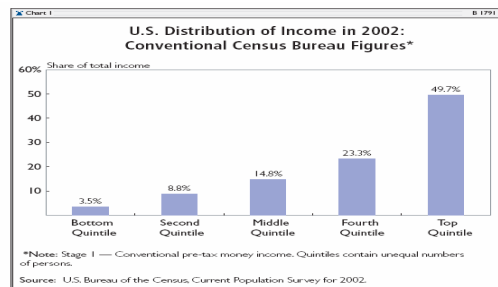
(2) persistent historical advantages– social networking

(3) noneconomic forces– social pressure or physical coercion

### Chapter 13: Labor Markets, Poverty, and Income Distribution

- A. Demand for labor
- B. Firm- versus industry labor demand
- C. Supply of labor
- D. Determinants of wages
- E. Discrimination
- F. The basic facts about income inequality

Top 20% of households earn 50% of income.  
Bottom 20% of households earn less than 4% of income.



But these figures are based on before-tax income.

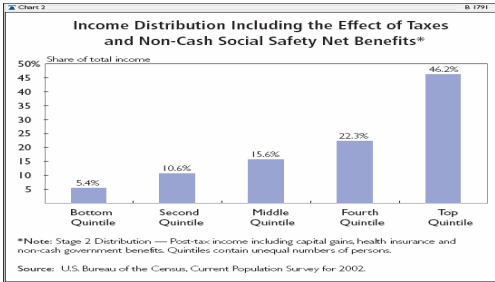
Richest 25% of U.S. taxpayers pay 83% of all income taxes.

Richest 1% pay 34%.

Source: U.S. Treasury Dept. Fact Sheet, April 2004

These figures also do not include the value of in-kind transfers to the lower income households (food stamps, housing, medical care,...)

After some of these corrections, top 20% of households earn 46% of income.  
Bottom 20% of households earn 5% of income.



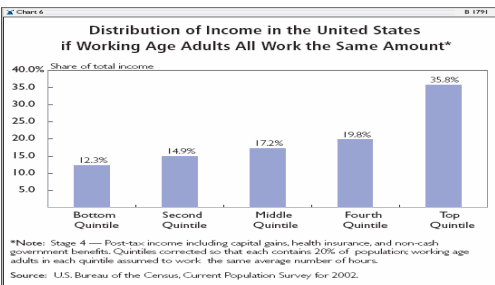
Top 20% of households by earnings include 25% of the population.

Bottom 20% of households by earnings include 14% of the population.

Top 20% of households by earnings performed 34% of hours worked.

Bottom 20% of households by earnings performed 4% of hours worked.

If each quintile included the same number of people working same number of hours, top 20% would earn 36% of income, bottom 20% would earn 12% of income.



Wages of those at the top of the earnings distribution have grown faster than those at the bottom.

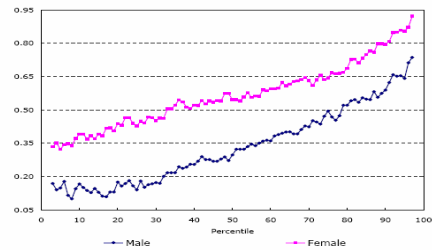
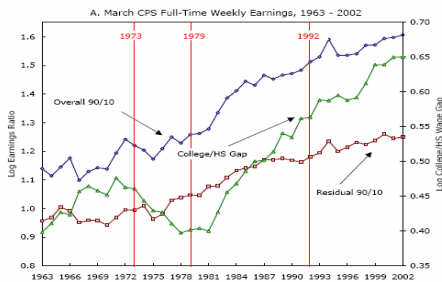


Figure 1. Change in Log Real Weekly Wage by Percentile, Full Time Workers, 1963 – 2002 (March CPS)

Source: Autor, Katz, and Kearney, NBER Working Paper, Aug. 2004

This increase in wage inequality is closely related to an increase in the difference in wages between college-educated and high-school-educated workers.



Source: Autor, Katz, and Kearney, NBER Working Paper, Aug. 2004

Adjusted for inflation, the minimum wage fell in the 1980's when wage inequality was rising.

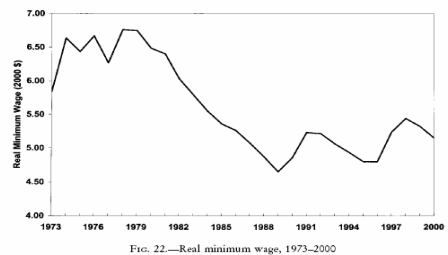
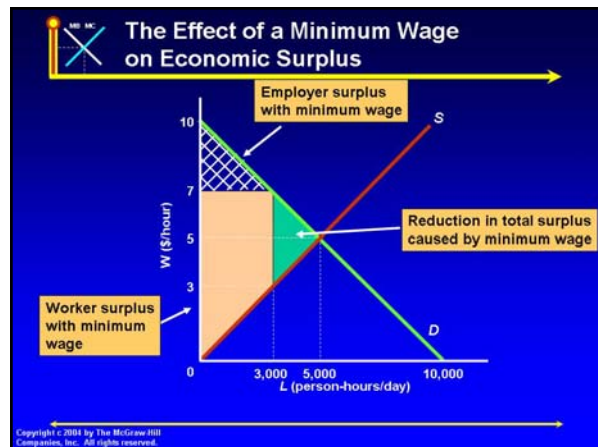
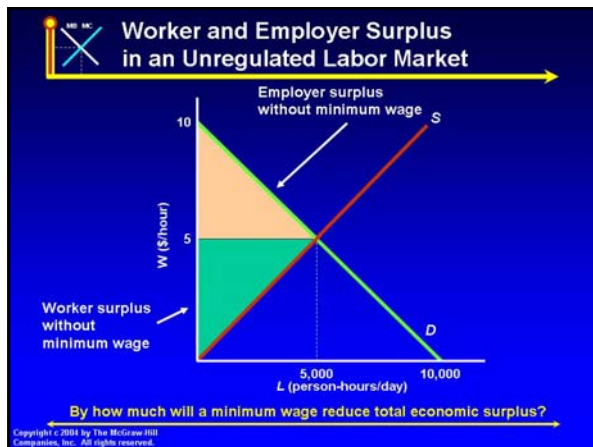
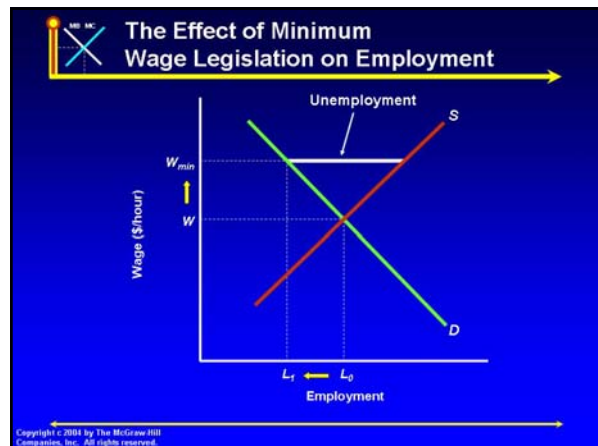


FIG. 22.—Real minimum wage, 1973–2000

Source: Card and DiNardo, Journal of Labor Economics, 2002.

## Chapter 13: Labor Markets, Poverty, and Income Distribution

- F. The basic facts about income inequality
- G. Policies to reduce income inequality
  1. Raising the minimum wage



- Conclusion: Raising minimum wage would:
- (1) Help poor workers who keep their jobs
  - (2) Hurt those who lose their jobs
  - (3) Hurt employers
  - (4) Maybe socially inefficient if (a) dollar value lost in (2) and (3) is bigger than dollar gain in (1) and (b) one puts equal weight on all sources of economic surplus

## Chapter 13: Labor Markets, Poverty, and Income Distribution

- F. The basic facts about income inequality
- G. Policies to reduce income inequality
  1. Raising the minimum wage
  2. Welfare programs

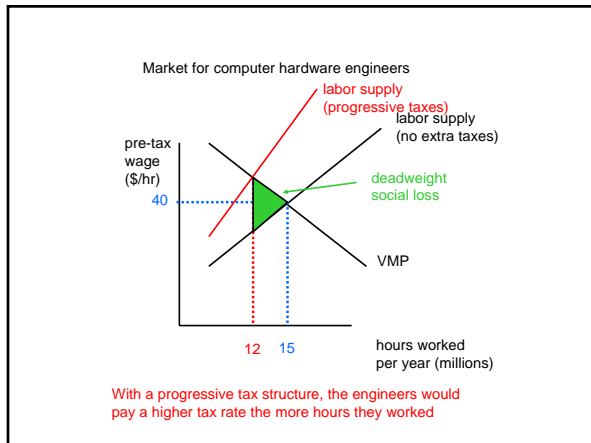
Cash benefits, medical assistance, housing, food stamps for the poor  
Paid for with tax on the rich

Two potential problems with existing welfare system:  
 (a) decreased work incentives caused by taxing those who are successful

progressive income tax:  
 the more you earn, the higher your tax rate in percentage terms

Current U.S. tax rates:

- \$50,000 taxable income, tax is \$9,238 (=18%)
- \$100,000 taxable income, tax is \$22,627 (=23%)



If progressive income taxes cause computer hardware engineers to work fewer hours or work in other occupations, there is a deadweight social loss

Two potential problems with existing welfare system:  
 (a) decreased work incentives caused by taxing those who are successful  
 (b) decreased work incentives caused by making benefits depend on low income

Means-tested benefit programs:  
 You only receive the benefit (food stamps, medical coverage, ...) if you are sufficiently poor

If someone from a poor household works more hours, they may lose their eligibility for Temporary Assistance for Needy Families, food stamps, Medicaid, housing assistance, child care, school lunches, earned income tax credit, ...

Example: single mother of 2 in Oklahoma in 1999

Single mother of 2 in Oklahoma in 1999 working at minimum wage (\$5.15/hr)

	no work	20 hr/week	40 hr/week
wages	0	446	892
EITC	0	179	318
FICA	0	-34	-68
TANF	292	163	0
food stamps	329	311	223
Medicaid	207	207	121
childcare copay	0	0	-32
total resources	\$828	\$1,272	\$1,454

Source: Hepner and Reed, Univ. of Okla., 2003

If she went from part-time to full-time, she would work an extra 20 hours per week in order to make her income rise from \$1,272 to \$1,454

Net pay rate: \$2.10/hour

Basic tradeoff:

**Equity:** we'd like the outcome to be equal and fair where everyone enjoys a decent standard of living

**Efficiency:** we'd like to make sure that the incentives encourage everyone to have as high a standard of living as possible

### Chapter 13: Labor Markets, Poverty, and Income Distribution

- F. The basic facts about income inequality
- G. Policies to reduce income inequality
  1. Raising the minimum wage
  2. Welfare programs
  3. Negative income tax

Negative income tax:

If your income is  $Y$ , your tax is

$$-\$10,000 + 0.25 \times Y$$

wage income	taxes owed	after-tax income		
0	-10,000	10,000		
6,000	-8,500	14,500		
12,000	-7,000	19,000		
50,000	2,500	47,500		
100,000	15,000	85,000		

wage income	taxes owed	after-tax income	average tax rate	
0	-10,000	10,000	0	
6,000	-8,500	14,500	0	
12,000	-7,000	19,000	0	
50,000	2,500	47,500	0.05	
100,000	15,000	85,000	0.15	

wage income	taxes owed	after-tax income	average tax rate	marginal tax rate
0	-10,000	10,000	0	0.25
6,000	-8,500	14,500	0	0.25
12,000	-7,000	19,000	0	0.25
50,000	2,500	47,500	0.05	0.25
100,000	15,000	85,000	0.15	0.25