THE LABOR MARKET

What determines wages? Employment?
How does the minimum wage work?
Why do some occupations/jobs earn more than others?

All of this can be explained using economic analysis of the labor market, using *supply and demand*

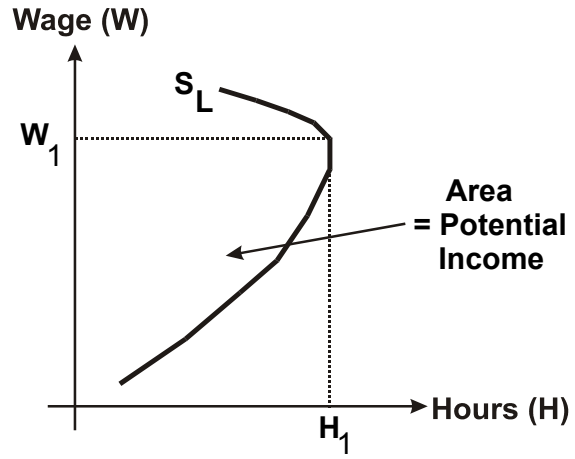
Labor Supply

For individuals, there is a tradeoff between labor and non-work uses of time, called the **labor-leisure tradeoff**

The cost of time is its opportunity cost: the wages that could be earned

- The higher is the wage, the more expensive is "leisure," which would lead to less leisure time and more work time ("time is money") other things equal
- BUT, the higher is the wage, the greater is the income one has from time allocated to work, making "leisure" more affordable

Q: What happens to hours (labor) supplied as the wage rises?
A: At first, the effect of higher "cost" of leisure dominates, leading to more hours supplied. After a point, the level of income allows persons to devote more time to leisure, reducing hours supplied. The result is a **backward bending labor supply curve**



At wages equal to or above W_1, *fewer* hours of work are supplied (note: potential income equals Wage x Hours, the area of the rectangle using W_1)

This curve has been used as an explanation of why labor force participation rates (% of the population in the labor force) are lower in developed countries than in LDCs

Male labor force participation has fallen relative to that of females in the US over the 1950 – 1998 period (source: BLS)

Table 2. Change in labor force participation by sex and age, 1950–98

Age group	Women			Men		
	1950	1998	Change	1950	1998	Change
16 and older	33.9	59.8	25.9	86.4	74.9	–11.5
16 to 24	43.9	63.3	19.4	77.3	68.4	–8.9
25 to 34	34.0	76.3	42.3	96.0	93.2	–2.8
35 to 44	39.1	77.1	38.0	97.6	92.6	–5.0
45 to 54	37.9	76.2	38.3	95.8	89.2	–6.6
55 to 64	27.0	51.2	24.2	86.9	68.1	–18.8
65 and older	9.7	8.6	–1.1	45.8	16.5	–29.3

Labor Demand

- The demand for labor is a *derived* demand: the demand for labor is derived from the demand for the products it produces (i.e., if there is no product demand, there is no need for labor)
- As firms maximize profits in the product market, they use this same emphasis with hiring decisions

Profit-maximizing condition: MC = MR

We need to apply this to labor demand
MC = additional cost of hiring one more hour of labor = **wage rate (W)**
MR = additional revenue associated with hiring and employing one more hour of labor

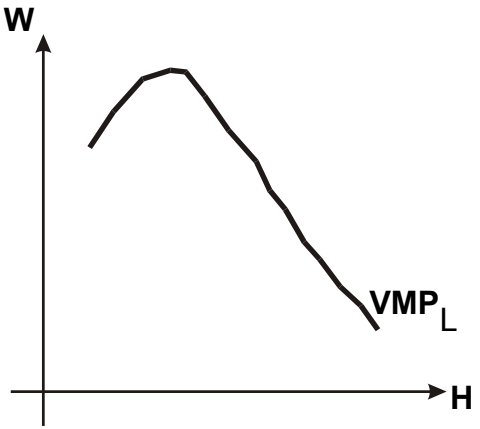
- since revenue is price x quantity, we need both a valuation factor (price) and the *additional* output produced when the extra hour of labor is used

Q: What is the additional output gained by using one more hour of labor?
A: *The marginal product of labor* (MP_L)

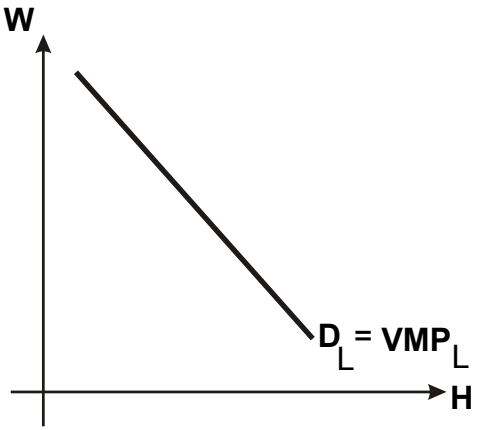
To get the MR from employment, we multiply the price (P) of the product by the MP_L
- by doing this we place a *value* on the marginal product, hence its name:

The **Value of the Marginal Product of Labor**, or $\mathbf{VMP_L = P \cdot MP_L}$

Since price (in competition) is constant, multiplying it by the MP_L produces a curve that looks exactly like the MP_L curve



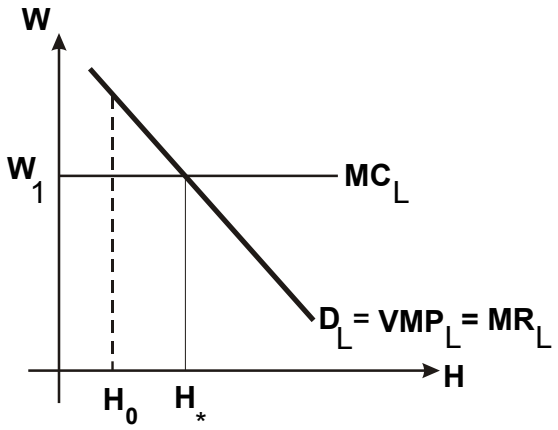
For technical reasons, we only use the downward-sloping portion of this curve



Anything that raises either P or MP_L increases the demand for labor, since then VMP_L is larger

A critical way to raise labor demand is through higher labor productivity – resulting from education and training
- in a knowledge-based economy like ours, *preserving* MP_L through your worklife will require you to acquire ever-increasing amounts of skill and training

Q: How do we determine hours demanded?
A: Find where $W = VMP_L$

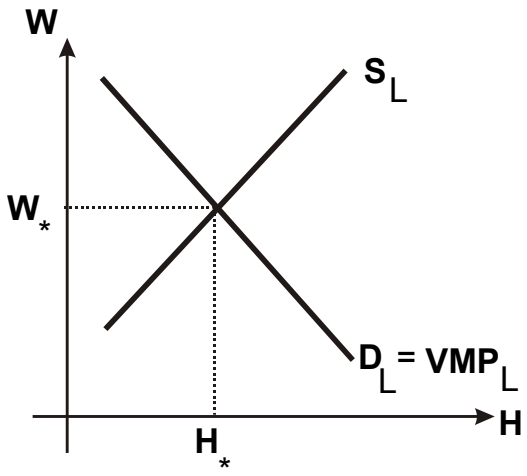


At wage W_1 labor demand is H_* hours, since for that number of hours MC_L (= wage) equals MR_L (=VMP_L)

- When $H < H_*$, say H_0 , $MR_L > MC_L$ so by increasing hours beyond H_0, the *added* revenue exceeds the *added* labor cost – and profits rise
- Beyond H_*, the opposite is true: the added costs exceed the added revenue, which lowers profit

Labor Market Equilibrium

- Based on supply/demand equilibrium
- The "going" wage and employment levels are the equilibrium wage and employment levels



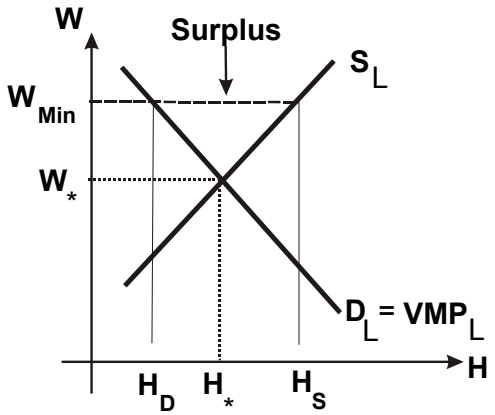
APPLICATIONS

The Minimum Wage

- This is an example of a **price floor**, a minimum price (wage) that can legally be paid

- As long as the equilibrium wage is not "locked out" by the minimum wage, the market will remain at its equilibrium
- True for RI in the late 1990s: minimum wage was $6.15, the "going" wage to hire and retain persons was around $6.75
- As of early 2003, labor market weakness had lowered the "going wage" to around $6.50 and RI passed an increase in its minimum wage to $6.75 (starting 7/1/03)

Q: What happens when the equilibrium wage is above the minimum wage?
A: Some unemployment is likely to occur



Here: $W_{MIN} > W_*$, so hours supplied exceeds hours demanded.

- *This surplus of hours represents either unemployment <u>under</u>employment(only able to work fewer than desired hours)*
- *If persons are moved from full-time to part-time employment they often lose fringe benefits(and they are <u>not</u> reflected in the official unemployment statistics)*

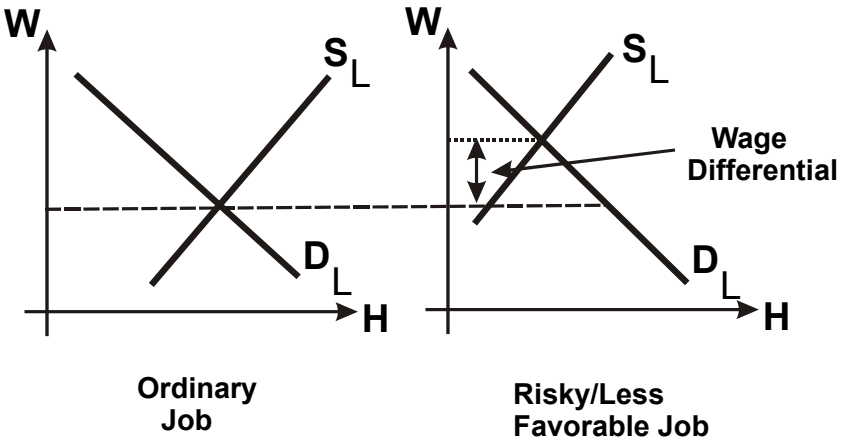
Q1: How can we eliminate the unemployment or underemployment?
A1: Enhance skills (education and training), making your labor demand more *in*elastic (giving you a niche and differentiation)
- This raises your MP_L, shifting the demand for labor curve right, hopefully making the minimum wage irrelevant for you

Q2: If the minimum wage remains unchanged through time, are its *economic* effects unchanged?
A2: **NO**! If the *nominal* minimum wage remains constant, the real minimum wage *falls* each year – by the rate of inflation.
- This lowers labor supply (it is actually based on the *expected real wage*), making it more difficult for firms to find workers
- It raises the quantity of labor demanded, since a lower real wage means labor is *less* expensive for firms
- If the nominal minimum wage remains constant through time, a *surplus* of labor can eventually become a *shortage* as the real minimum wage eventually moves above the equilibrium real wage!!

Wage Differences

The above analysis assumes one type of labor (and job). When differences exist between workers (ex: skilled vs. unskilled) or jobs (safe vs. very risky, preferred working conditions vs. less preferred), wage differences emerge. *These remain in the labor market's equilibrium*

Compensating Wage Differentials are wage differences associated with more risky jobs (ex: painting the top of a bridge) or less preferred jobs (ex: the late shift). The lower labor supply in these jobs translates into higher wages



Greater labor supply in the "ordinary job" causes lower *relative* wages in those jobs

These same graphs can be used to contrast skilled versus unskilled labor.

- *The smaller supply of skilled labor ensures higher wages in "skilled" occupations*
- *This provides a "return" to investments in* ***HUMAN CAPITAL***
- *This framework can be used to analyze the rising wage gap between high school grads (only) and college educated workers*

From: "The Churn: The Paradox of Progress," ***Federal Reserve Bank of Dallas, 1992 Annual Report***

Joseph A. Schumpeter

In the 1930s, Joseph A. Schumpeter advanced the idea that an economy doesn't grow but evolves, continuously re-creating itself as people seek to improve their standard of living. Schumpeter called this process "creative destruction." Today, "the churn" is sometimes used to describe the same principle. Implicit in either term is the paradox that Schumpeter uncovered: innovation—the manifestation of the individual's quest for gain—is central to economic progress but, at the same time, is the cause of most economic difficulties.

Creative Destruction over the Past Century

Millions of American workers today earn their living in occupations that did not exist at the beginning of the 20th century.

	People Employed		
Destruction	**Today**	**Yesterday**	
Railroad employees	231,000	2,076,000	1920
Carriage and harness makers	*	109,000	1900
Telegraph operators	8,000	75,000	1920
Boilermakers	*	74,000	1920
Milliners	*	100,000	1910
Cobblers	25,000	102,000	1900
Blacksmiths	*	238,000	1910
Watchmakers	*	101,000	1920
Switchboard operators	213,000	421,000	1970
Farm workers	851,000	11,533,000	1910

Creation	**Today**	**Yesterday**	
Airline pilots and mechanics	232,000	0	1900
Medical technicians	1,379,000	0	1910
Engineers	1,846,000	38,000	1900
Computer programmers/operators	1,287,000	*	1960
Fax machine workers	699,000	0	1980
Auto mechanics	864,000	0	1900
Truck, bus and taxi drivers	3,328,000	0	1900
Professional athletes	77,000	*	1920
TV and radio announcers	60,000	*	1930
Electricians/electronic repairers	711,000	51,000	1900
Optometrists	62,000	*	1910

* Less than 5,000

DATA SOURCE: U.S. Bureau of the Census

Technological Unemployment

Unemployment is a common, though typically only temporary, result of technological progress. As entrepreneurs invent new products, old jobs often give way to new ones.

New Product	*Labor Needed*	**Old Product**	*Labor Released*
Automobile	Assemblers Designers Road builders Petrochemists Mechanics Truck drivers	**Horse/carriage** **Train** **Boats**	Blacksmiths Wainwrights Drovers Teamsters RR workers Canalmen
Airplane	Pilots Mechanics Flight attendants Travel agents	**Train** **Ocean liner**	RR workers Sawyers Mechanics Ship hands Boilermakers
Plastics	Petrochemists	**Steel** **Aluminum** **Barrels/tubs** **Pottery/glass**	Miners Founders Metalworkers Coopers Potters Colliers
Television	Electronic engineer Actors Reporters Electricians	**Newspaper** **Theater** **Movies** **Radio**	Reporters Actors
Computer	Programmers Computer engineers Electrical engineers Software designers	**Adding machine** **Slide rule** **Filing cabinets** **Paper**	Assemblers Millwrights Clerks Tinsmiths Lumberjacks
Fax machine	Programmers Electricians Software designers	**Express mail** **Teletype**	Mail sorters Truck drivers Typists
Telephone	Electronic engineers Operators Optical engineers Cellular technicians	**Mail** **Telegraph** **Overnight coach**	Postal workers Telegraph operators Coach drivers
Polio vaccine	Chemists Lab technicians Pharmacists	**Iron lung**	Manufacturers Attendants

DATA SOURCE: U.S. Bureau of the Census

New and Emerging Occupations
(according to US Bureau of Labor Statistics:
http://www.bls.gov/oes/oes_new.htm)

Administrative Assistants
Convention Managers
Web Masters
Environmental Engineers
Computer Managers
Bankruptcy Specialists
Desktop Publishing Specialists
Utilization Review Coordinators
Quality Assurance (QA) Directors
Consumer Credit Counselors
Resettlement Coordinators
Bus Aides
Volunteer Coordinators
Credentiallers
Job Coaches
Development Directors

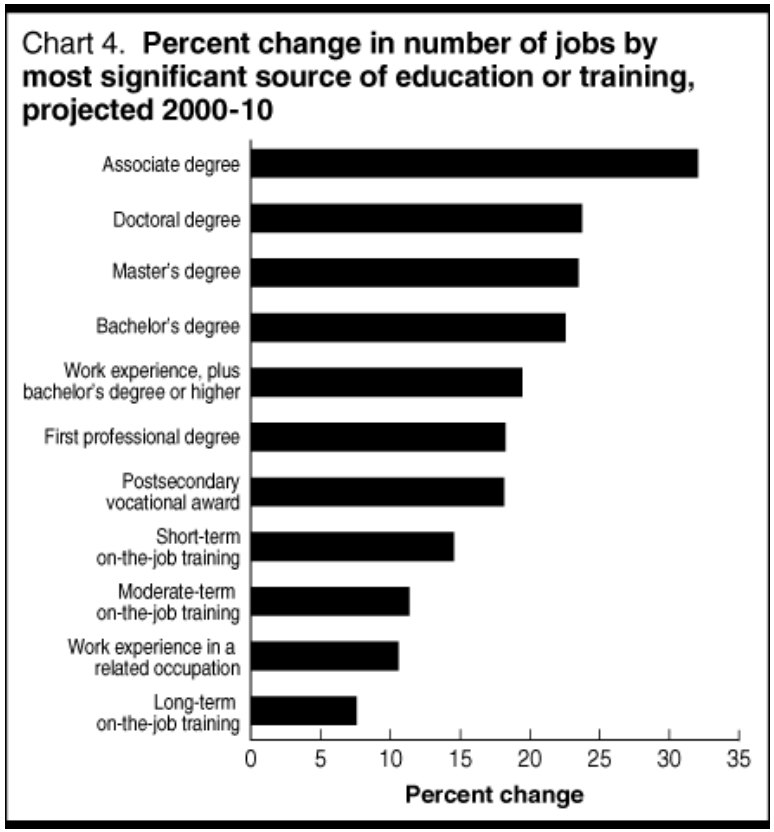


Table 3b. Fastest growing occupations, 2000-10
[Numbers in thousands of jobs]

Occupation	Employment		Change	
	2000	2010	Number	Percent
Computer software engineers, applications	380	760	380	100
Computer support specialists	506	996	490	97
Computer software engineers, systems software	317	601	284	90
Network and computer systems administrators	229	416	187	82
Network systems and data communications analysts	119	211	92	77
Desktop publishers	38	63	25	67
Database administrators	106	176	70	66
Personal and home care aides	414	672	258	62
Computer systems analysts	431	689	258	60
Medical assistants	329	516	187	57

Source: http://www.bls.gov/news.release/ecopro.t06.htm

Table 3a. Industries with the fastest wage and salary employment growth, 2000-2010

Industry description	Thousands of jobs		Change	Average annual rate of change
	2000	2010	2000-2010	2000-2010
Computer and data processing services	2,095	3,900	1,805	6.4
Residential care	806	1,318	512	5.0
Health services, nec.	1,210	1,900	690	4.6
Cable and pay television services	216	325	109	4.2
Personnel supply services	3,887	5,800	1,913	4.1
Warehousing and storage	206	300	94	3.8
Water and sanitation	214	310	96	3.8
Miscellaneous business services	2,301	3,305	1,004	3.7
Miscellaneous equipment rental and leasing	279	397	118	3.6
Management and public relations	1,090	1,550	460	3.6

NOTE: nec. = not elsewhere classified

Source: **http://www.bls.gov/news.release/ecopro.t03.htm**

Table 2. Employment by major occupational group, 2000 and projected 2010
[Numbers in thousands of jobs]

Occupational group	Employment				Change	
	Number		Percent distribution		Number	Percent
	2000	2010	2000	2010		
Total, all occupations	145,594	167,754	100.0	100.0	22,160	15.2
Management, business, and financial occupations	15,519	17,635	10.7	10.5	2,115	13.6
Professional and related occupations	26,758	33,709	18.4	20.1	6,952	26.0
Service occupations	26,075	31,163	17.9	18.6	5,088	19.5
Sales and related occupations	15,513	17,365	10.7	10.4	1,852	11.9
Office and administrative support occupations	23,882	26,053	16.4	15.5	2,171	9.1
Farming, fishing, and forestry occupations	1,429	1,480	1.0	.9	51	3.6
Construction and extraction occupations	7,451	8,439	5.1	5.0	989	13.3
Installation, maintenance, and repair occupations	5,820	6,482	4.0	3.9	662	11.4
Production occupations	13,060	13,811	9.0	8.2	750	5.7
Transportation and material moving occupations	10,088	11,618	6.9	6.9	1,530	15.2

NOTE: Detail may not equal total or 100 percent due to rounding.

Source: http://www.bls.gov/news.release/ecopro.t02.htm