### The Value of Time

$$t_{X}X + t_{Y}Y + T_{W} = T$$

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Lectures in Microeconomics-Charles W. Upton

#### The Value of Time

 Almost all economic purchases require time to use. This is a cost of the good.



The Value of Time

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The Value of Time

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- Add the time cost, valued at the consumer's wage rate, to the cost of the product; and
- Add the value of time, again valued at the wage rate, to the budget constraint.



The Value of Time

## Hiring A Mowing Service

Hiring a Mowing Service			
	Wilson	Smith	
Mowing Service	\$500	\$500	
Out of Pocket, Self Mowing	\$100	\$100	
Time Cost	\$300	\$4,000	
Savings from Self Mowing	\$100	(\$3600)	

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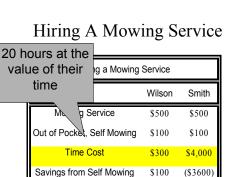
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#### The Formal Model

The Value of Time

- Each unit of X takes t<sub>x</sub> hours;
- Each unit of Y takes t, hours.

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#### The Formal Model

- Each unit of X takes t<sub>x</sub> hours;
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- The consumer spends T<sub>w</sub> hours working and has T hours after allowing for sleep.



The Value of Time

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$$t_{x}X + t_{y}Y + T_{w} = T$$

$$p_{x}X + p_{y}Y = wT_{w} + V$$

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The Value of Time

The Formal Model

$$p_{X}X+p_{V}Y=wT_{W}+V$$

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The Formal Model

$$p_{X}X + p_{y}Y = wT_{w} + V$$
$$t_{X}X + t_{y}Y + T_{w} = T$$

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The Formal Model

$$p_{X}X + p_{y}Y = wT_{w} + V$$

$$t_{x}X + t_{y}Y + T_{w} = T$$

$$T_{w} = T - (t_{x}X + t_{y}Y)$$

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The Value of Time

The Formal Model

$$\begin{aligned}
p_{X}X + p_{y}Y &= wT_{w} + V \\
t_{x}X + t_{y}Y + T_{w} &= T \\
T_{w} &= T - (t_{x}X + t_{y}Y)
\end{aligned}$$

$$(p_{X} + wt_{X})X + (p_{y} + wt_{y})Y = wT + V$$

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The Value of Time

The Formal Model

$$(p_x+wt_x)X + (p_y + wt_y)Y = wT + V$$

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The Formal Model

$$(p_x+wt_x)X + (p_y + wt_y)Y = WT + V$$
  
 $F_x = p_x+wt_x$ 

$$F_y = p_y + wt_y$$

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The Value of Time

#### The Formal Model

$$F_xX + F_yY = wT + V$$

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#### An Illustration

Commodity	Wage Rate	Time	Out of Pocket Cost	Cost
X	\$10	2 hours	\$15	\$35
Y	\$10	3 hours	\$5	\$35

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The Value of Time

#### An Illustration

Commodity	Wage Rate	Time	Out of Pocket Cost	Cost
	\$15	2 hours	\$15	\$45
X	<del>\$10</del>			<del>\$35</del>
	\$15	3 hours	\$5	\$55
Y	<del>\$10</del>			<del>\$35</del>

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## Some Applications

- Shopping
  - Why do senior citizens shop on weekdays and working people on weekends? Different values of time?

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The Value of Time

## Some Applications

- Shopping
- Dinner Reservations
  - Restaurants that take reservations must charge more
  - Thus students will favor restaurants that don't take reservations
  - High wage earners will favor a policy of reservations.

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# Some Applications

- Shopping
- Dinner Reservations
- · Automobiles or Mass Transit
  - Mass transit is cheaper but slower, hence its appeal to low income households.

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# Some Applications

- Shopping
- Dinner Reservations
- · Automobiles or Mass Transit
- Convenience Foods
  - Time is money

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End

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