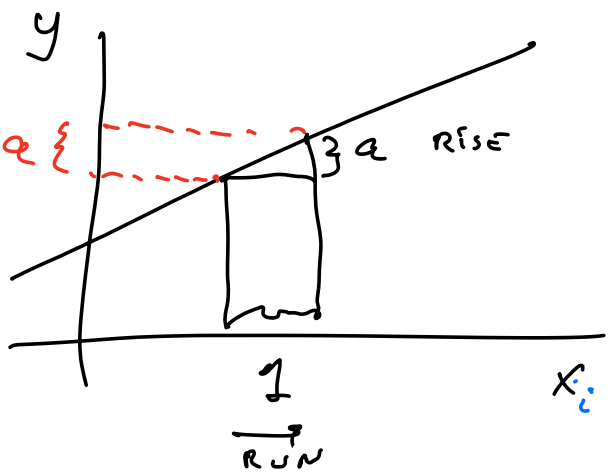
Any linear function



$$y_i = a \cdot x_i + b$$

$$dy = a \cdot dx + 0$$

$$\frac{dy}{dx} = a$$

How do we interpret a?

y - \$ $x \rightarrow$ \$ (units)

SLOPE: For A (1 unit) 1\$ change in X, y changes by a \$.

ELASTICITIES

$$E = \frac{\frac{\Delta y}{y}}{\frac{\Delta x}{x}} \Rightarrow \frac{\Delta y}{\Delta x} \cdot \frac{x}{y}$$

ELASTICISING

$\frac{\Delta y}{\Delta x} \rightarrow \frac{dy}{dx}$ = SLOPE

$$\varepsilon = \frac{\Delta y}{\Delta x} \cdot \frac{x}{y} = \text{SLOPE} \cdot \frac{x}{y}$$

$$y_i = a \cdot x_i + b$$

$$= a \cdot \frac{x_i}{(a \cdot x_i + b)}$$

So THE ELASTICITY VARIES ALONG THE LINEAR FUNCTION.

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ln is natural log.

$$\underline{\ln(y)} = b_1 + b_2 \cdot \ln(x)$$

What is the slope of this fn?

Take total diff.

$$\frac{1}{y} dy = 0 + b_2 \frac{1}{x} dx \qquad \Big| \cdot x \;/ dx$$

$$\frac{dy}{dx} \cdot \frac{x}{y} = b_2$$

Elasticity

$$\frac{dy}{dx} \cdot \frac{x}{y} = b_2 \qquad \Big| \cdot \frac{y}{x}$$

$$\frac{dy}{dx} = b_2 \frac{y}{x} \quad \Leftarrow \text{slope}$$