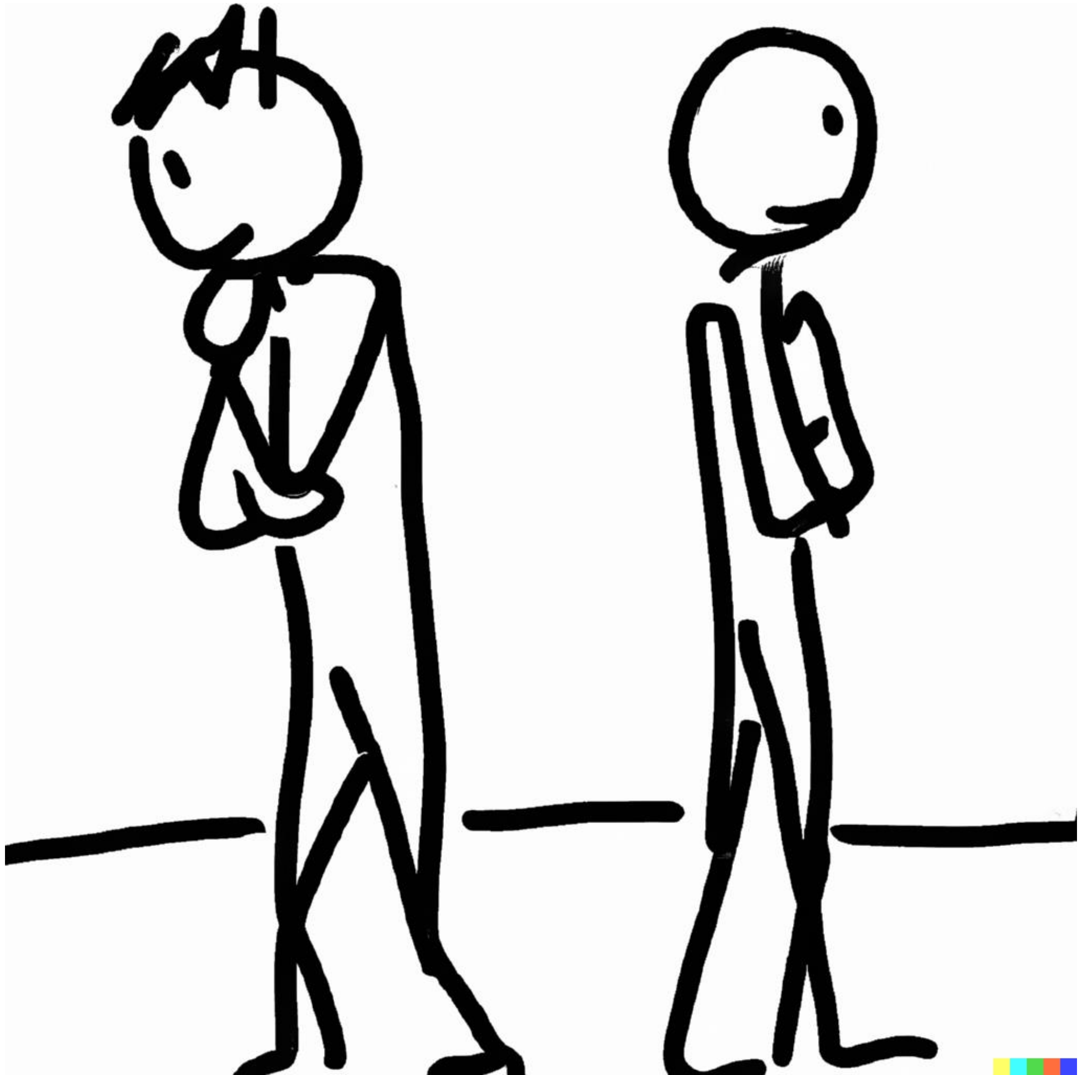
# People care about resource distribution

Notes on Behavioural Economics

Jason Collins




STATE WORKER SALARY DATABASE

# How much do California state workers get paid? Search public salaries in our database

Search our salary database to find government wages and compensation records.

https://www.sacbee.com/news/databases/state-pay/

# Distributional preferences

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$$U_i(x_i\ ) = x_i$$

$$\Downarrow$$

$$U_i\left(x_i, x_j\right) = x_i + \alpha x_j$$

**Distributional preferences**

Deviation from self-interest

Inequality and social comparison

Workplace and policy design

## Distributional preferences

Altruism

Inequality aversion

Other social preferences

# Altruism

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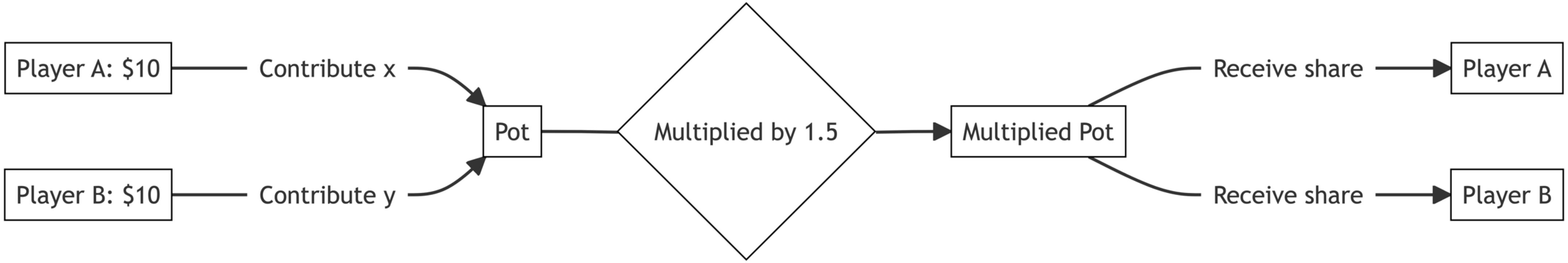
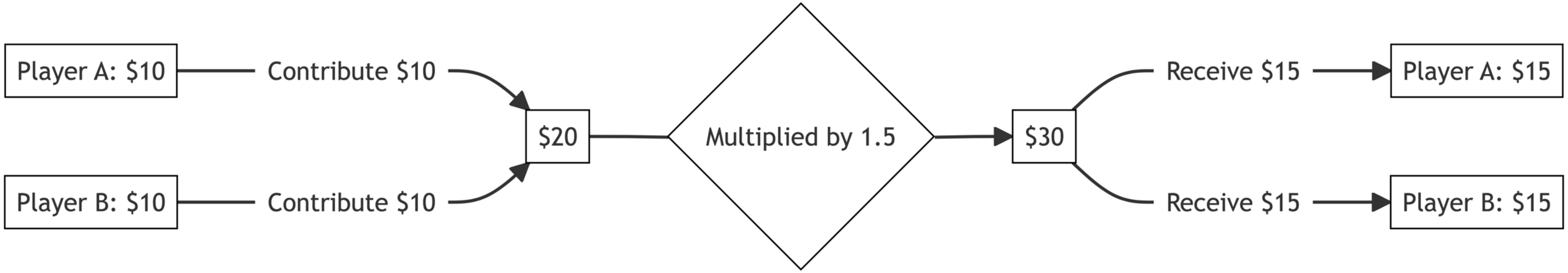
Forms:

- Pure altruism
- Impure altruism

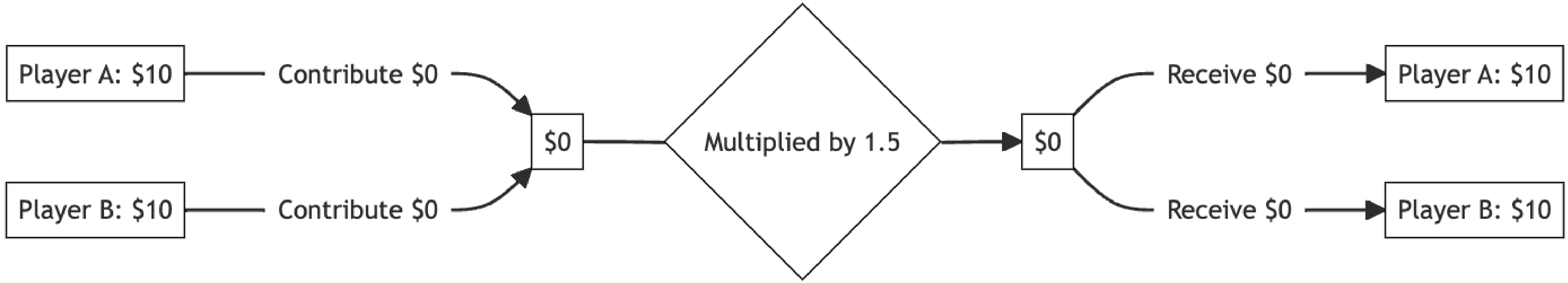
# Example: the public goods game



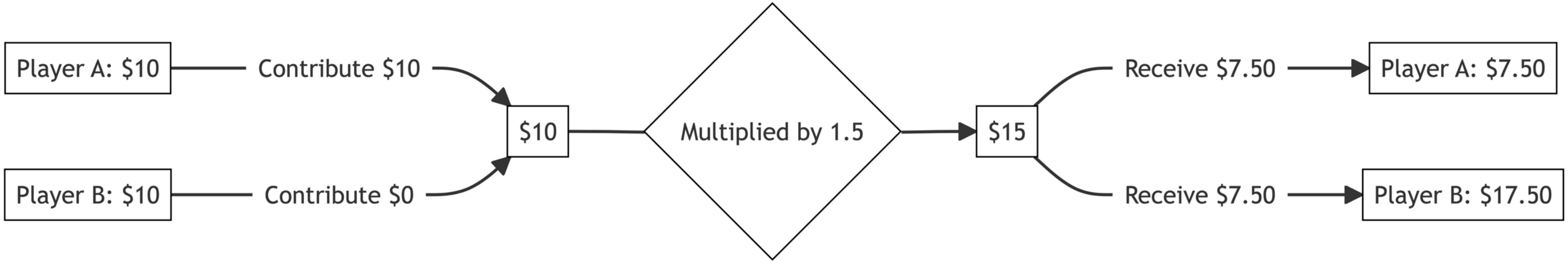
# Example: the public goods game - cooperation



# Example: the public goods game – no cooperation



# Example: the public goods game - defection



# Example: the public goods game

$$U_i(x_i, x_j) = x_i + 0.75x_j$$

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$$U_i(\text{contribute}) = 15 + 0.75 \times 15$$

$$= 26.25$$

## Example: the public goods game

$$U_i\left(x_i, x_j\right) = x_i + 0.75x_j$$

$$U_i(\text{contribute}) = 15 + 0.75\ \times\ 15$$
$$= 26.25$$

$$U_i(\text{free ride}) = 17.50 + 0.75\ \times\ 7.5$$
$$= 23.125$$

## Example: the public goods game

$$U_i\left(x_i, x_j\right) = x_i + 0.75x_j$$

$$\begin{aligned} U_i(\text{contribute}) &= 7.5 + 0.75\ \times\ 17.5 \\ &= 20.625 \end{aligned}$$

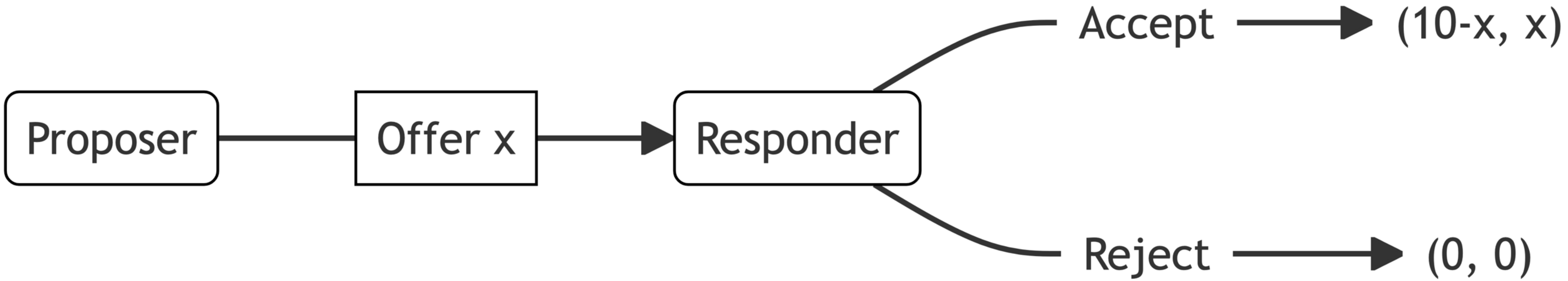
## Example: the public goods game

$$U_i(x_i, x_j) = x_i + 0.75x_j$$

$$U_i(\text{contribute}) = 7.5 + 0.75 \times 17.5$$
$$= 20.625$$

$$U_i(\text{free ride}) = 10 + 0.75 \times 10$$
$$= 17.5$$

# Limitations of the altruism model



# Inequality aversion

## Inequality aversion

$$U_i(x_i, x_j) = x_i - \alpha \max\{x_j - x_i, 0\} - \beta \max\{x_i - x_j, 0\}$$

$$\alpha > 0 \quad \beta > 0$$

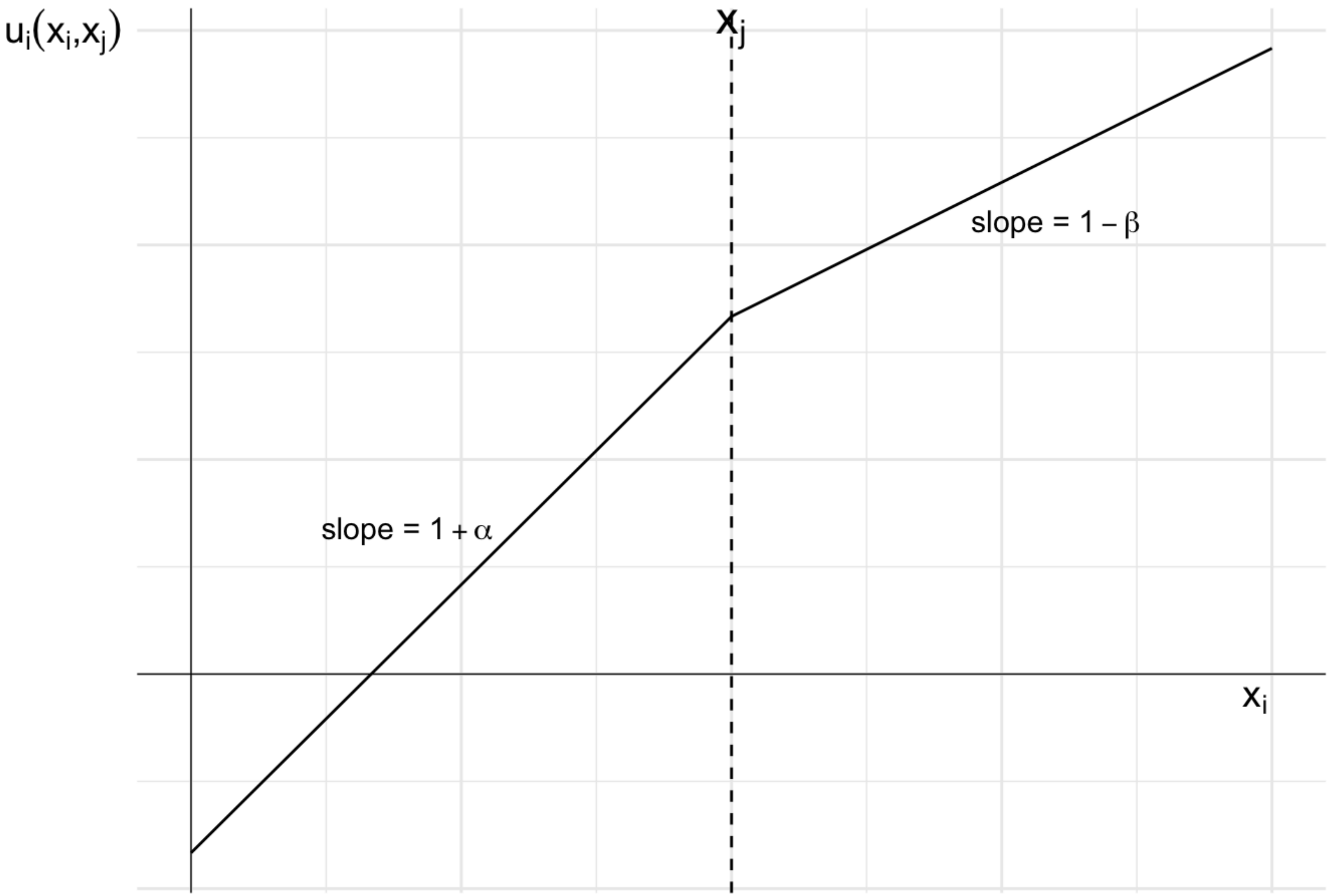
## Inequality aversion

$$U_i(x_i, x_j) = x_i - \alpha \max\{x_j - x_i, 0\} - \beta \max\{x_i - x_j, 0\}$$

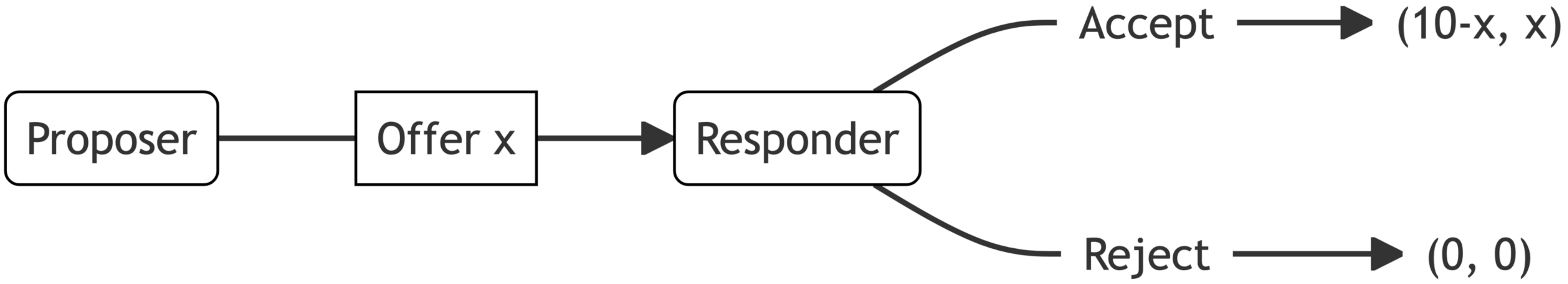
$$\alpha > 0 \quad \beta > 0$$

$$u_i(x_i, x_j) = x_i - \begin{cases} \beta(x_i - x_j) & \text{if} \quad x_i \geq x_j \\ \alpha(x_j - x_i) & \text{if} \quad x_i < x_j \end{cases}$$

# Inequality aversion



# Example: the ultimatum game



## Example: the ultimatum game

$$U_i(x_i, x_j) = x_i - 0.5\,\max\{x_j - x_i, 0\} - 0.25\,\max\{x_i - x_j, 0\}$$

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$$U_i(x_i, x_j) = x_i - 0.5\max\{x_j - x_i, 0\} - 0.25\max\{x_i - x_j, 0\}$$

Rejects:

$$x_P = x_R = 0$$

## Example: the ultimatum game

$$U_i(x_i, x_j) = x_i - 0.5 \max\{x_j - x_i, 0\} - 0.25 \max\{x_i - x_j, 0\}$$

Rejects:

$$x_P = x_R = 0$$

Accepts:

$$x_P = 10 - x$$

$$x_R = x.$$

## Example: the ultimatum game

$$U_i(x_i, x_j) = x_i - 0.5\max\{x_j - x_i, 0\} - 0.25\max\{x_i - x_j, 0\}$$

$$U_R(\text{accept}) > U_R(\text{reject})$$

## Example: the ultimatum game

If the offer is \$5 or greater:

$$U_R(\text{accept}) > U_R(\text{reject})$$

$$x_R - \beta(x_R - x_P) > 0$$

$$x - 0.25\big(x - (10 - x)\big) > 0$$

$$x - 0.25(2x - 10) > 0$$

## Example: the ultimatum game

If the offer is less than \$5:

$$U_R(\text{accept}) > U_R(\text{reject})$$

$$x_R - \alpha(x_P - x_R) > 0$$

$$x - 0.5(10 - x - x) > 0$$

$$x > 2.5$$

## Example: the ultimatum game

$$
\begin{aligned}
U_R(x_P, x_R) &= x_R - \alpha \max\{x_P - x_R, 0\} - \beta \max\{x_P - x_R, 0\} \\
&= x - 0.5 \max\{10 - 2x, 0\} - 0.25 \max\{2x - 10,0\}
\end{aligned}
$$

## Example: the ultimatum game

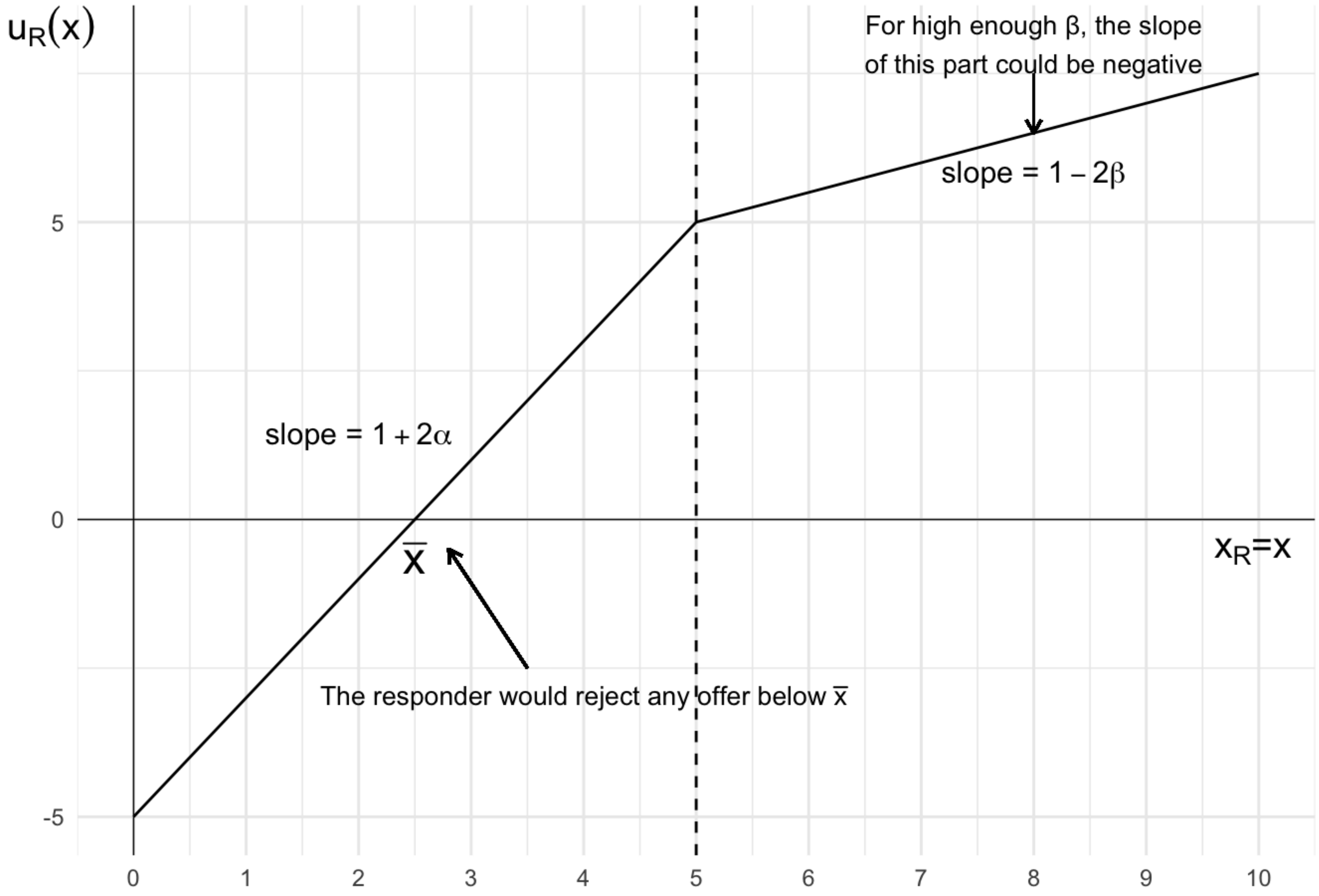
$$U_R(x_P, x_R) = x_R - \alpha \max\{x_P - x_R, 0\} - \beta \max\{x_P - x_R, 0\}$$

$$= x - 0.5 \max\{10 - 2x, 0\} - 0.25 \max\{2x - 10,0\}$$

$$U_R(x) = \begin{cases} (1 + 2\alpha)x - 10\alpha & \text{if} \quad x < 5 \\ (1 - 2\beta)x + 10\beta & \text{if} \quad x \geq 5 \end{cases}$$

$$= \begin{cases} 2x - 5 & \text{if} \quad x < 5 \\ 0.5x + 2.5 & \text{if} \quad x \geq 5 \end{cases}$$

# Example: the ultimatum game



**Example: the dictator game**

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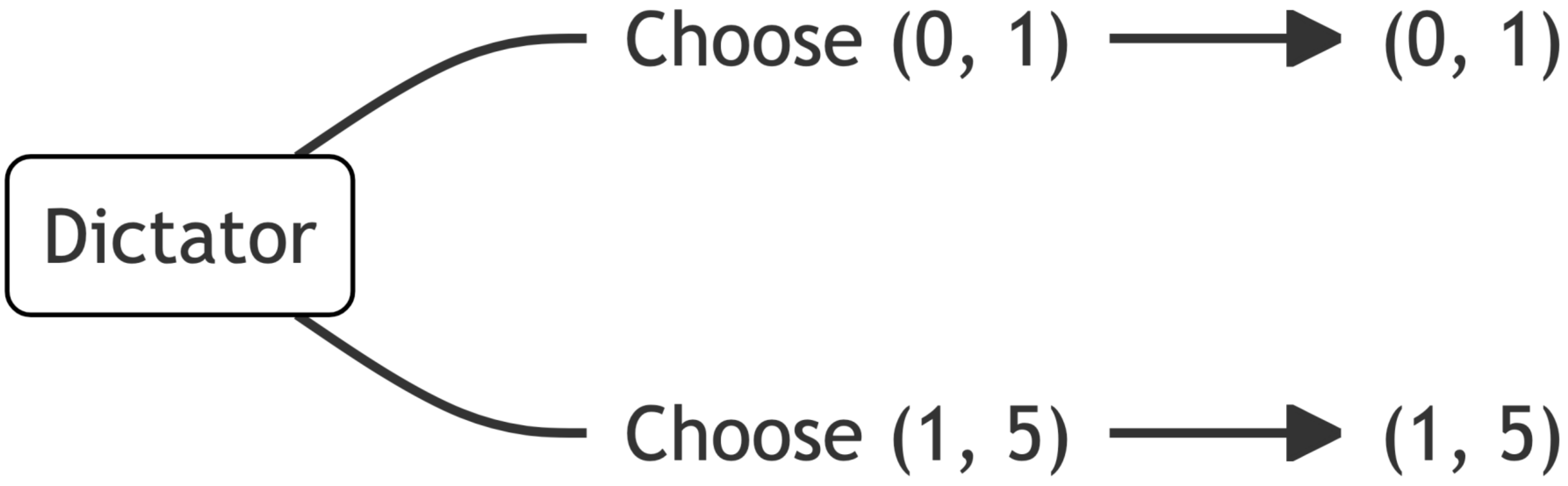
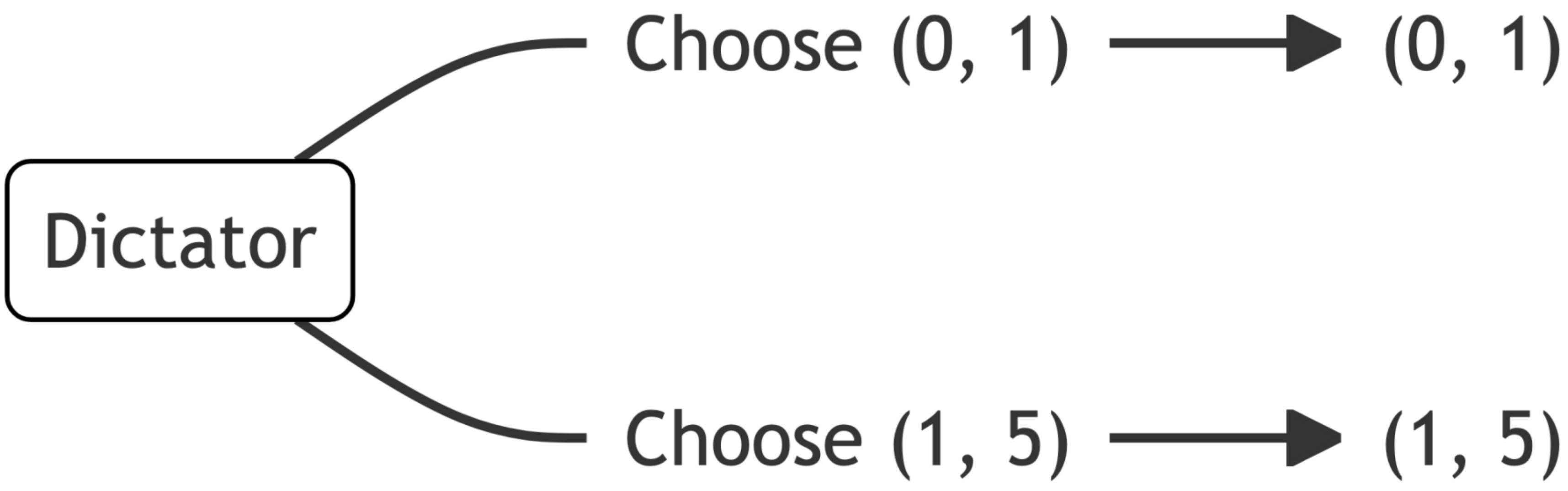


## Example: the dictator game




$\alpha = 0.5$

## Example: the dictator game

$$U_D(0,1) = 0 - \alpha \times (1-0)$$

$$= -\frac{1}{2} \times 1$$

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$$U_D(0,1) = 0 - \alpha \times (1 - 0)$$

$$= -\frac{1}{2} \times 1$$

$$= -\frac{1}{2}$$

$$U_D(1,5) = 1 - \alpha \times (5 - 1)$$

$$= 1 - \frac{1}{2} \times 2$$

$$= -1$$

# Other distributional preferences

$$u_i(x_i, x_j) = \begin{cases} \beta x_j + (1-\beta)x_i & \text{if} \quad x_i \geq x_j \\ -\alpha x_j + (1+\alpha)x_i & \text{if} \quad x_i < x_j \end{cases}$$

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$$u_i(x_i, x_j) = \begin{cases} \rho x_j + (1-\rho)x_i & \text{if} \quad x_i \geq x_j \\ \sigma x_j + (1-\sigma)x_i & \text{if} \quad x_i < x_j \end{cases}$$

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$\rho > 0$ and $\sigma > 0$: altruism

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$\rho > 0$ and $\sigma > 0$: altruism

$1 \geq \rho > 0 > \sigma$: inequality aversion

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$1 \geq \rho \geq 0 \geq \sigma$: inequality aversion

$0 > \rho \geq \sigma$: status-seeking

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$\rho > 0$ and $\sigma > 0$: altruism

$1 \geq \rho \geq 0 \geq \sigma$: inequality aversion

$0 \geq \rho \geq \sigma$: status-seeking

$\rho = \sigma = 0$: the classical self-interested utility function

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$\rho = \sigma = 0$: the classical self-interested utility function

$\rho = 1, \;\; \sigma = 0$: $u_i(x_i, x_j) = \min\{x_i, x_j\}$, Rawlsian preferences

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$$u_i(x_i, x_j) = \begin{cases} \rho x_j + (1-\rho)x_i & \text{if} \quad x_i \geq x_j \\ \sigma x_j + (1-\sigma)x_i & \text{if} \quad x_i < x_j \end{cases}$$

$\rho > 0$ and $\sigma > 0$: altruism

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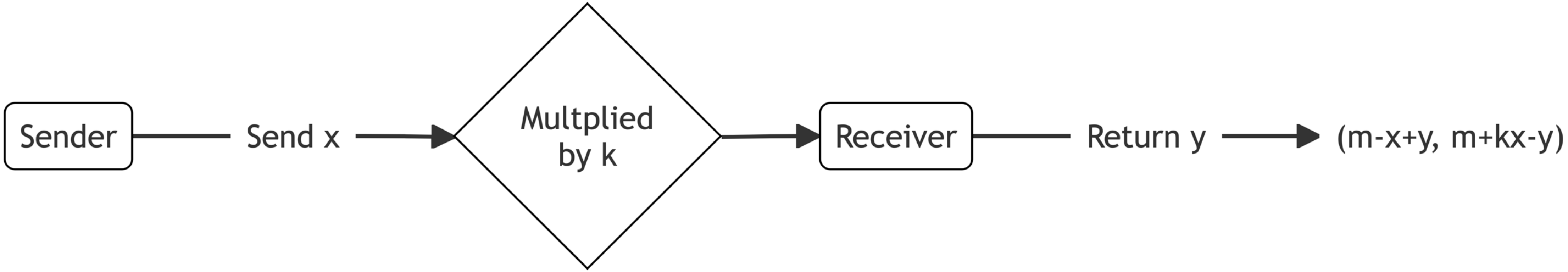
$\rho = 1, \ \ \sigma = 0$: $u_i(x_i, x_j) = \min\{x_i, x_j\}$, Rawlsian

$\rho = \sigma = 1/2$: $u_i(x_i, x_j) = x_i + x_j$: utilitarian

# Example: the trust game



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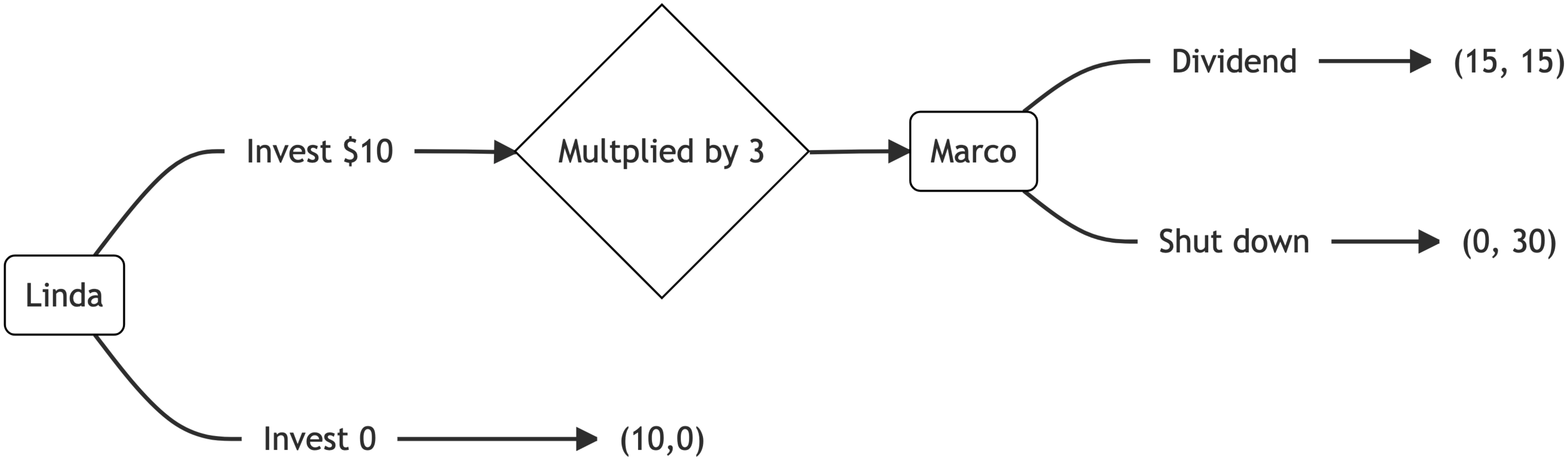

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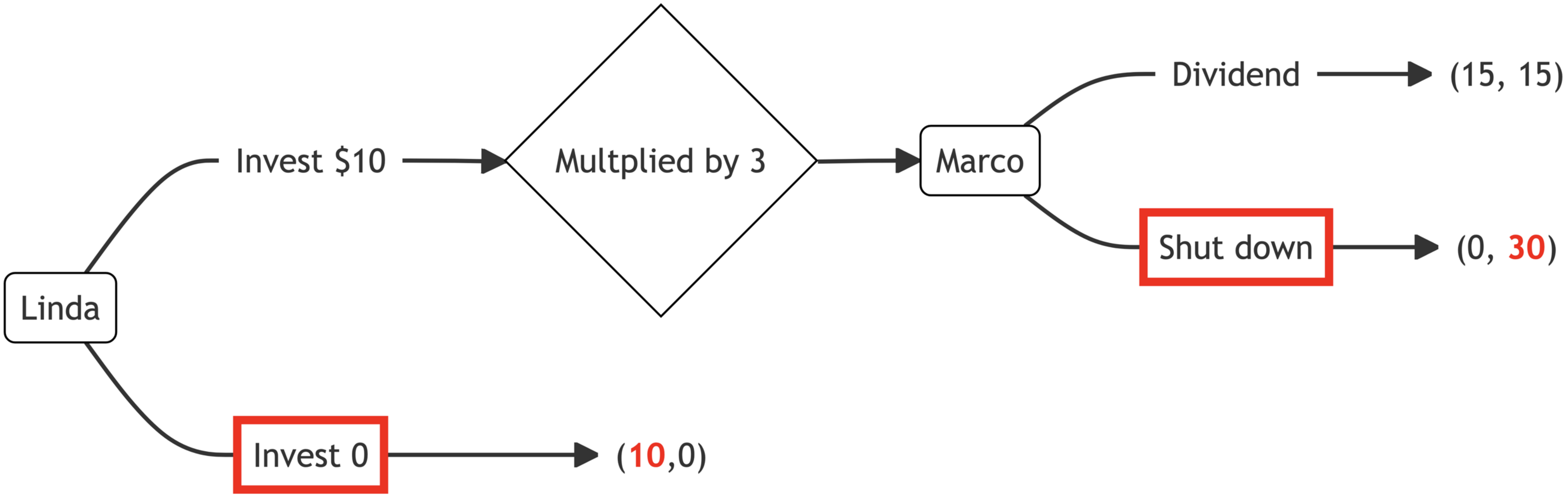

## Example: the trust game

$$U_L(x_M, x_L) = \begin{cases} \frac{2}{3}x_M + \frac{1}{3}x_L & \text{if} \quad x_L \geq x_M \\ \frac{1}{3}x_M + \frac{2}{3}x_L & \text{if} \quad x_L < x_M \end{cases}$$

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$$U_L(x_M, x_L) = \begin{cases} \frac{2}{3}x_M + \frac{1}{3}x_L & \text{if} \quad x_L \geq x_M \\ \frac{1}{3}x_M + \frac{2}{3}x_L & \text{if} \quad x_L < x_M \end{cases}$$

$$U_M(x_L, x_M) = \begin{cases} \frac{3}{4}x_L + \frac{1}{4}x_M & \text{if} \quad x_M \geq x_L \\ x_M & \text{if} \quad x_M < x_L \end{cases}$$

## Example: the trust game

$$U_M(x_L, x_M) = \begin{cases} \dfrac{3}{4}x_L + \dfrac{1}{4}x_M & \text{if } \; x_M \geq x_L \\ x_M & \text{if } \; x_M < x_L \end{cases}$$

If Linda invests, Marco's utility of each outcome is:

$$U_M(15{,}15) = \frac{3}{4}(15) + \frac{1}{4}(15)$$

$$= 15$$

$$U_M(0{,}30) = \frac{3}{4}(0) + \frac{1}{4}(30)$$

$$= 7.5$$

## Example: the trust game

$$U_L(x_M, x_L) = \begin{cases} \frac{2}{3}x_M + \frac{1}{3}x_L & \text{if} \quad x_L \geq x_M \\ \frac{1}{3}x_M + \frac{2}{3}x_L & \text{if} \quad x_L < x_M \end{cases}$$

If Linda invests, Linda's utility from each outcome is:

$$U_L(15{,}15) = \frac{2}{3}(15) + \frac{1}{3}(15)$$

$$= 15$$

$$U_L(0{,}30) = \frac{1}{3}(30) + \frac{2}{3}(0)$$

$$= 10$$

## Example: the trust game

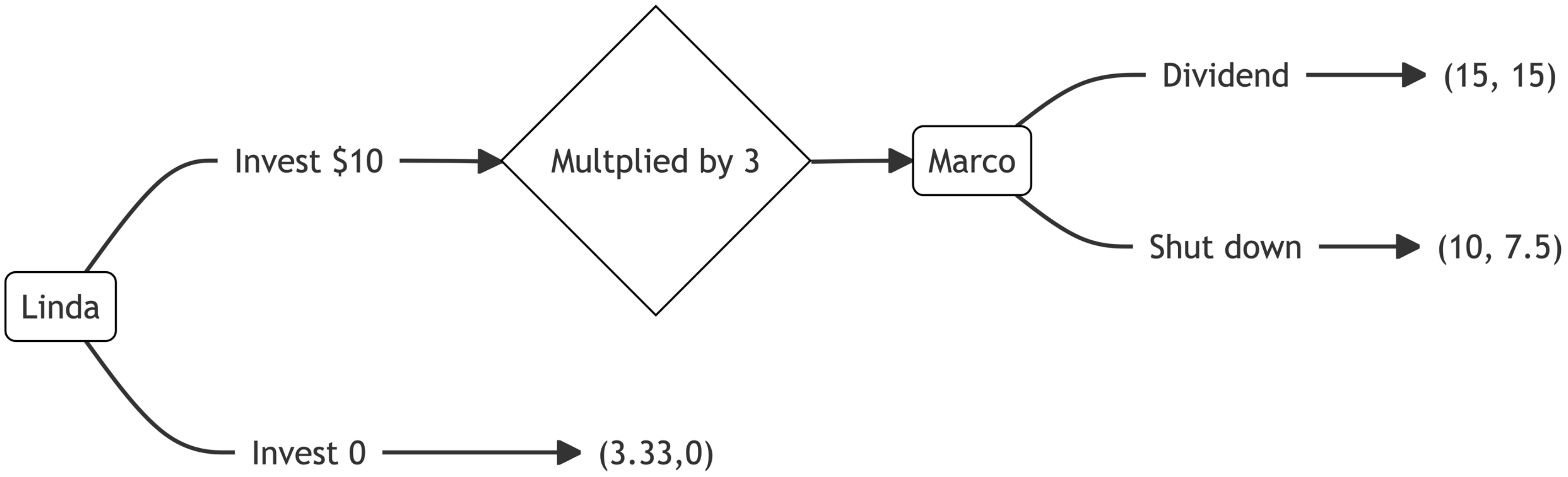
If Linda does not invest:

$$U_L(0,10) = \frac{2}{3}(0) + \frac{1}{3}(10)$$

$$= 3.33$$

$$U_M(10,0) = 0$$

# Example: the trust game



# Example: the trust game