

- (b) Find all equilibria (pure and mixed), first analytically and then through plotting the BR functions.

		Player 2	
		L (q)	R (1-q)
Player 1	T (p)	1, 1	0, 0
	B (1-p)	1, 0	2, 1

***Highlight the best responses in pure strategies.***

## PS4, Ex. 1.b (A): MSNE and best-response functions

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		Player 2	
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***For which values of  $q$  is Player 1 indifferent?***

Find  $q$  such that Player 1 expects to have equal payoffs from playing  $T$  and  $B$ :

$$\begin{aligned} E[u_1(T)|q] &= E[u_1(B)|q] \\ &= \end{aligned}$$

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$$E[u_1(T)|q] = E[u_1(B)|q]$$
$$q = q + 2(1 - q) \Leftrightarrow q = 1$$

***For which values of  $p$  is Player 2 indifferent?***

Find  $p$  such that Player 2 expect to have equal payoffs from playing  $L$  and  $R$ :

$$E[u_2(L)|p] = E[u_2(R)|p]$$
$$=$$

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Find  $p$  such that Player 2 expect to have equal payoffs from playing  $L$  and  $R$ :

$$E[u_2(L)|p] = E[u_2(R)|p]$$

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

and chooses  $q = 1$  for  $p > 1/2$ .

**Write up all NE (pure and mixed).**

## PS4, Ex. 1.b (A): MSNE and best-response functions

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Player 1 is indifferent for:

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The pure and mixed NE,  $(p^*, q^*)$ , are:

$$\left\{ (0, 0); (1, 1); \left( p \in \left[ \frac{1}{2}, 1 \right], q = 1 \right) \right\}$$

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$$BR_1(q) = \{$$

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**Write up Player 1's best-response (BR) function,  $p^*(q)$**

## PS4, Ex. 1.b (A): MSNE and best-response functions

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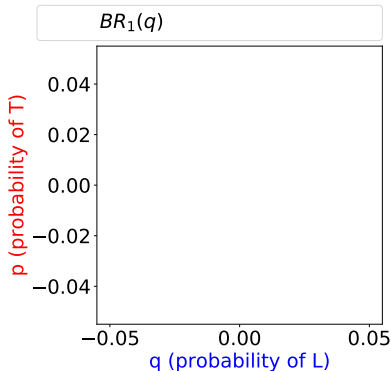
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**Plot Player 1's best-response (BR) function,  $p^*(q)$**

Then through plotting the BR functions:

$$BR_1(q) = \begin{cases} p = 0 & \text{if } q < 1 \\ p \in [0, 1] & \text{if } q = 1 \end{cases}$$



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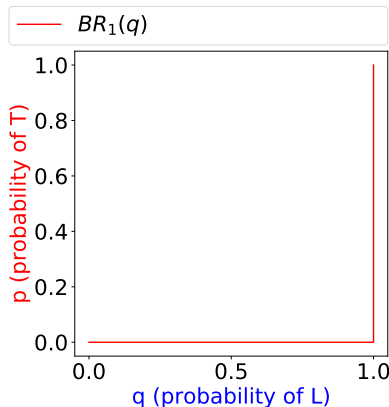
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**Write up Player 2's BR function,  $q^*(p)$**

Then through plotting the BR functions:

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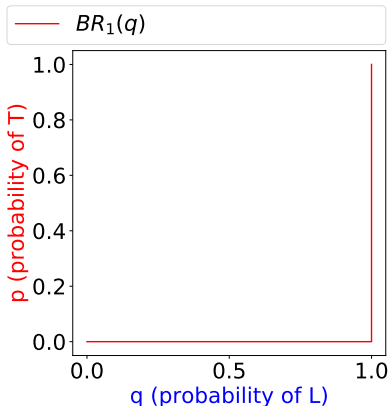
$$\left\{ (0, 0); (1, 1); \left( p \in \left[ \frac{1}{2}, 1 \right), q = 1 \right) \right\}$$

**Plot Player 2's BR function,  $q^*(p)$**

Then through plotting the BR functions:

$$BR_1(q) = \begin{cases} p = 0 & \text{if } q < 1 \\ p \in [0, 1] & \text{if } q = 1 \end{cases}$$

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