

Q1 – solution a,b,c,d a,b,c,d

- Consider an economy with 3 agents:
 - 2 speculators who hold domestic currency and who can decide whether to sell or hold it
 - the central bank that sells or buy foreign reserves to keep the exchange rate fixed. To this end the central bank commits a finite stock of reserves, say R . This amount of foreign reserves measures the tenacity of the central bank to defend its currency (and defend the peg)
 - we assume that there are only 2 currencies: the domestic currency and the foreign currency
 - the amount of foreign currency held by the central bank determines the amount of the so-called foreign reserves

Q1 - solution a,b,c,d

- The current fixed exchange rate between the two currencies is equal to 1
- Each speculator has 5 units of domestic currency
- Speculators expect that the domestic currency will be devaluated by 100%
(many of you considered 50%, I don't know why)
- Any transaction in foreign currency involves a cost equal to 1 unit of domestic currency
- We consider 3 cases:
 - a) case $R=5$
 - b) case $R=20$
 - c) case $R=8$

To solve the model under the 3 cases we will consider a simple static game of complete info

Q1 - solution a,b,c,d

a) case $R=5$

		Speculator #1	
		hold	sell
Speculator #2	hold	0, 0	0, 24
	sell	4, 0	1.5, 1.5

Q1- solution a,b,c,d

a) case $R=5$

		Speculator #1	
		hold	sell
Speculator #2	hold	0, 0	0, 4
	sell	4, 0	1.5, 1.5

- If only one speculator decides to sell, the currency will be devalued. Her/his payoff will be $5 \times (1+1) - 5 - 1 = 4$. She/he first sells the domestic currency for foreign currency at the initial exchange rate 1. The central bank in the attempt to defend the peg finds itself with no foreign reserves and is forced to devalue the domestic currency by 100%. The speculator then converts the foreign currency she/he holds into the devalued domestic currency getting back $10 = 5 \times (1+1)$ units of the domestic currency. The net payoff immediately follows: $5 \times (1+1) - 5 - 1 = 4$

Q1 - solution a,b,c,d

a) case $R=5$

		Speculator #1	
		hold	sell
Speculator #2	hold	0, 0	0, 4
	sell	4, 0	1.5, 1.5

- If both speculators decide to sell domestic currency the central bank can only sell 5 units of foreign currency. We assume that each speculator will be able to exchange only 2.5 units of domestic currency in exchange of foreign currency at the initial exchange rate 1. The central bank in the attempt to defend the peg finds itself with no foreign reserves and is forced to devalue the domestic currency by 100%. The speculators then convert the foreign currency they hold in the devalued domestic currency getting back $5 = 2.5 \times (1+1)$ units of domestic currency. The net payoff immediately follows.... $2.5 \times (1+1) - 2.5 - 1 = 1.5$

Q1 - solution a,b,c,d

a) case $R=5$

		Speculator #1	
		hold	sell
Speculator #2	hold	0, 0	0, 4
	sell	4, 0	1.5, 1.5

- The dominant strategy will then be sell
- The equilibrium will be sell, sell

Q1 - solution a,b,c,d

b) case $R=20$

		Speculator #1	
		hold	sell
Speculator #2	hold	0, 0	0, -1
	sell	-1, 0	-1,-1

Q1 - solution a,b,c,d

b) case $R=20$

		Speculator #1	
		hold	sell
Speculator #2	hold	0, 0	0, -1
	sell	-1, 0	-1,-1

- Even if both speculators decide to sell domestic currency, the peg will be maintained since the central bank has committed enough reserves to defend its currency and keep the exchange rate fixed
- The currency will not be devalued
- The two speculators will loose -1

Q1 - solution a,b,c,d

b) case $R=20$

		Speculator #1	
		hold	sell
Speculator #2	hold	0, 0	0, -1
	sell	-1, 0	-1, -1

- The dominant strategy will then be hold
- The equilibrium will be hold, hold

Q1 - solution a,b,c,d

c) case $R=8$

		Speculator #1	
		hold	sell
Speculator #2	hold	0, 0	0, -1
	sell	-1, 0	3, 3

Q1 - solution a,b,c,d

c) case $R=8$

		Speculator #1	
		hold	sell
Speculator #2	hold	0, 0	0, -1
	sell	-1, 0	3, 3

- If only one speculator decides to sell, the currency will not be devalued. Her/his payoff will -1.

Q1 - solution a,b,c,d

c) case $R=8$

		Speculator #1	
		hold	sell
Speculator #2	hold	0, 0	0, -1
	sell	-1, 0	3, 3

- If both speculators decide to sell domestic currency the central bank can only sell 8 units of foreign currency. We assume that each speculator will be able to exchange only 4 units of domestic currency in exchange of foreign currency at the initial exchange rate 1. The central bank in the attempt to defend the peg finds itself with no foreign reserves and is forced to devalue the domestic currency by 100%. The speculators then convert the foreign currency they hold into the devalued domestic currency getting back $8=4 \times (1+1)$ units of domestic currency. The net payoff immediately follows.... $4 \times (1+1)-4-1=3$

Q1 - solution a,b,c,d

c) case $R=8$

		Speculator #1	
		hold	sell
Speculator #2	hold	0, 0	0, -1
	sell	-1, 0	3, 3

- There's no dominant strategy
- There are two equilibria
- Self-fulfilling prophecies are possible

Q1 - solution a,b,c,d

In the c) case ($R=8$) to generate a crisis there must be a spark that acts as coordination device...or some bad fundamentals (skeletons in the cupboard) that may push speculators to bet against a currency

This is the most interesting case!