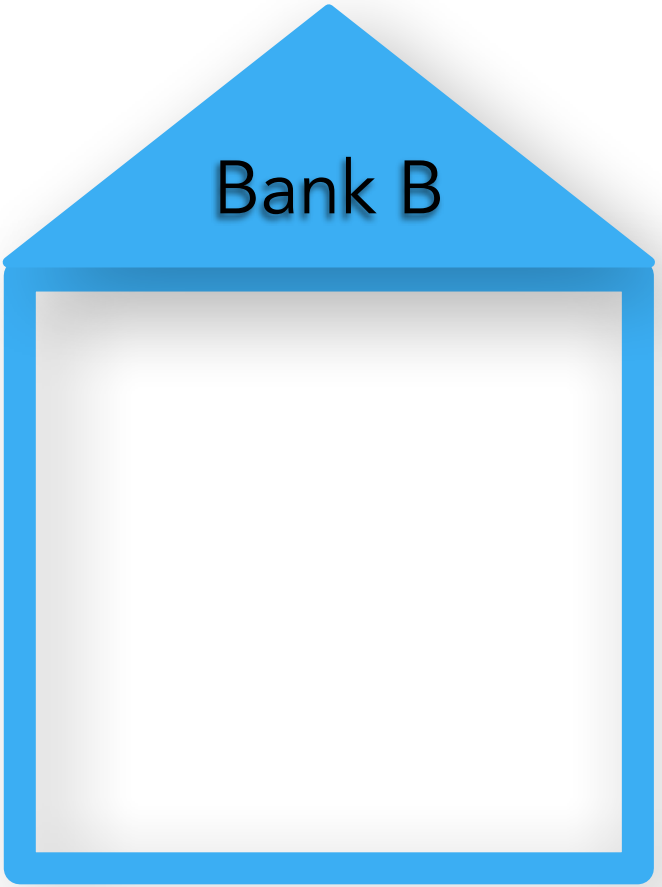
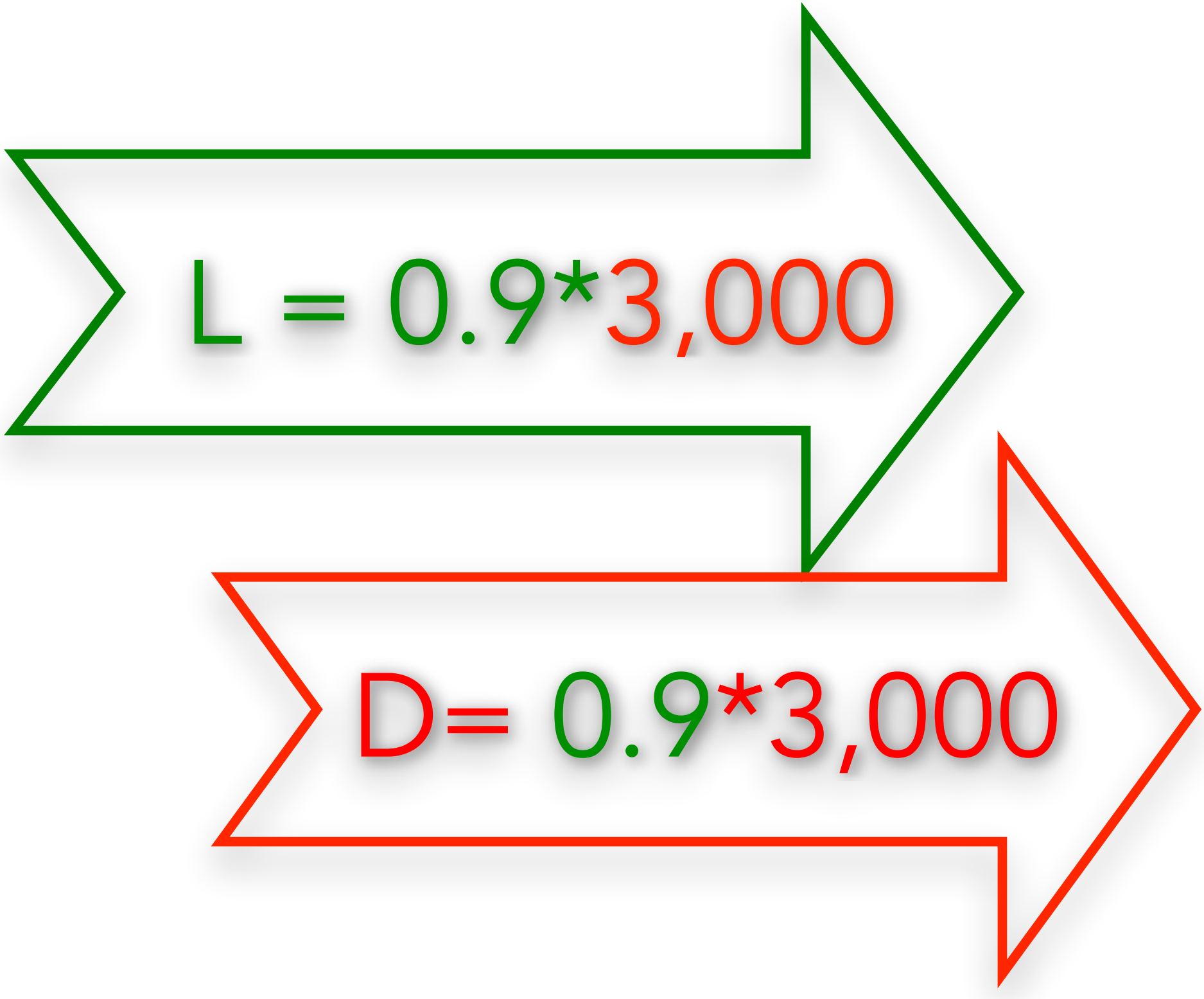
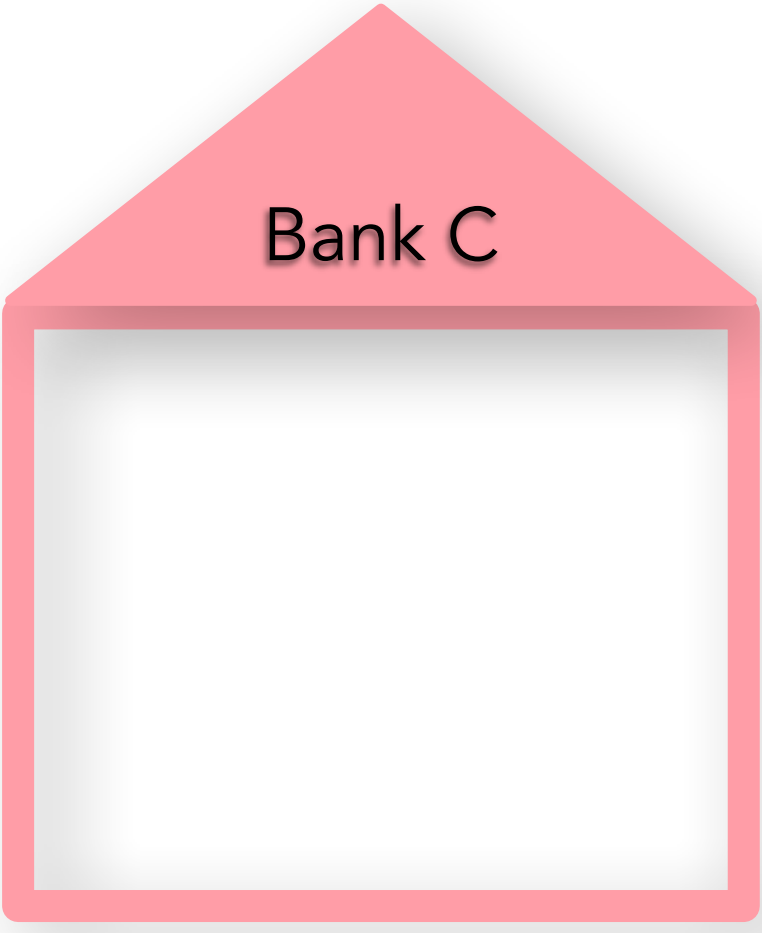
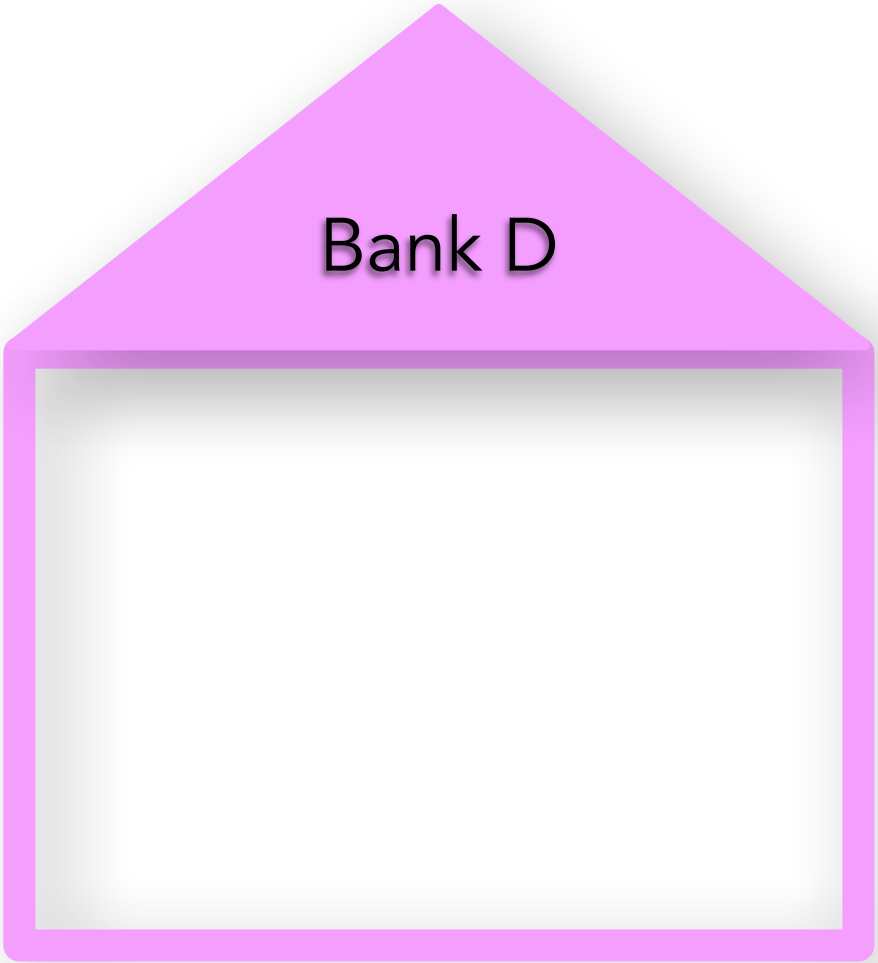

Bank A

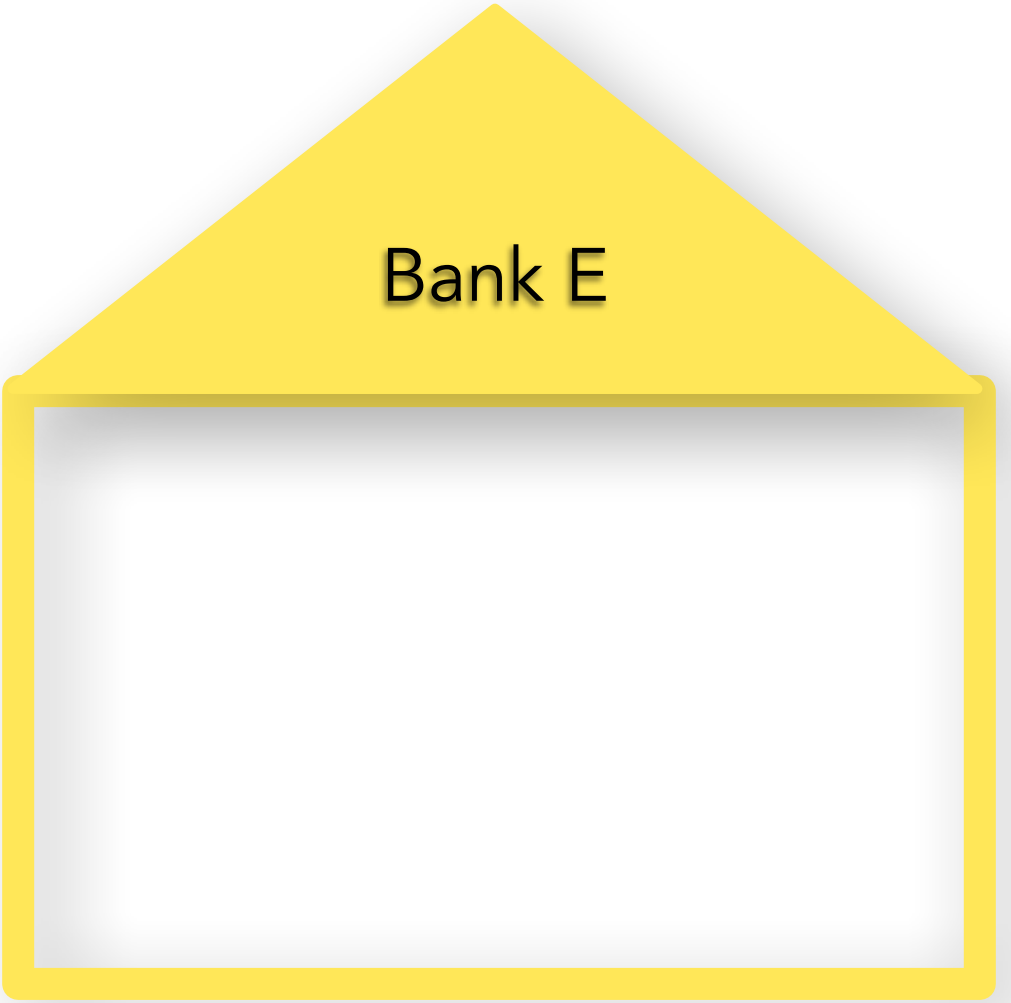

New
Money:
3,000b

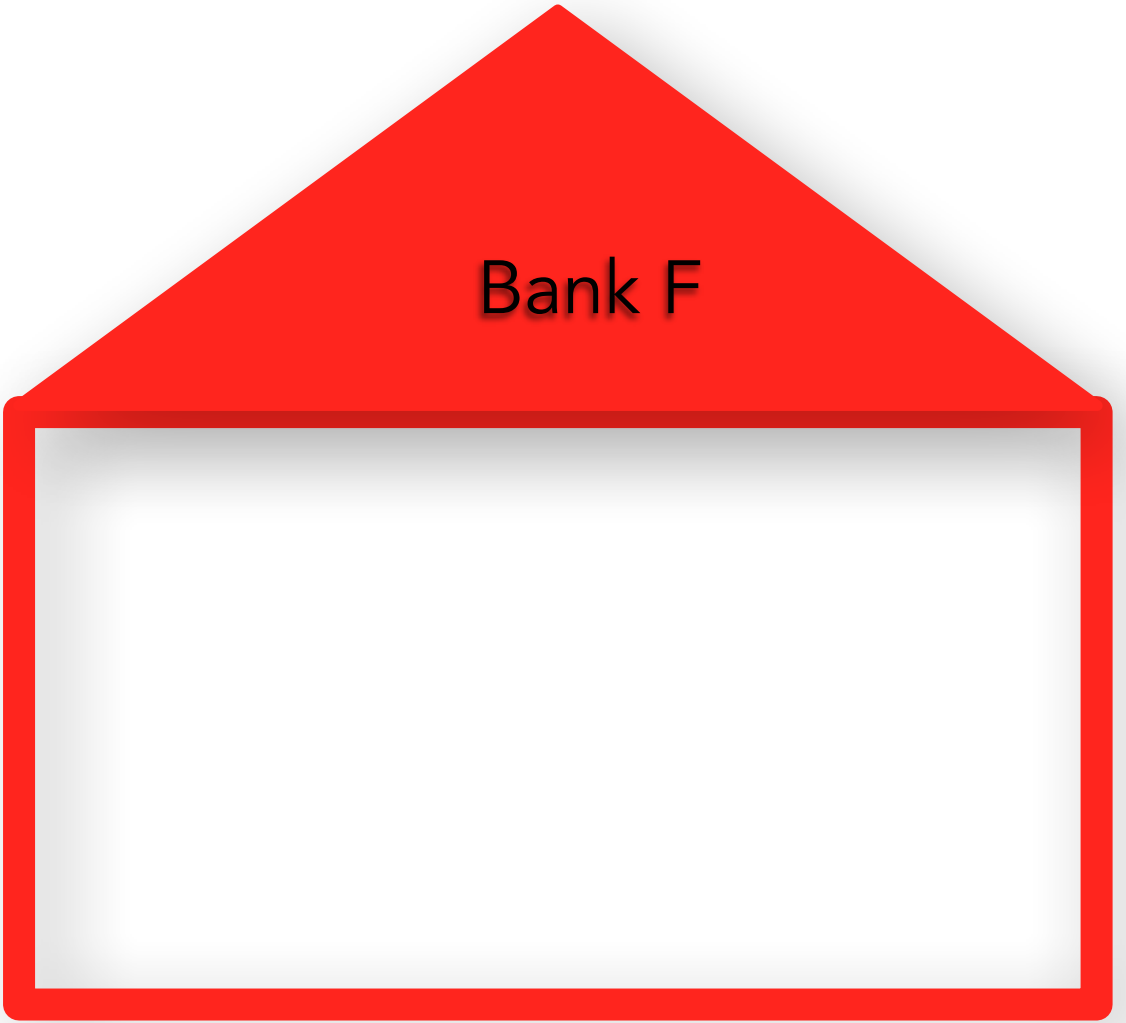

Bank B


L = 0.9*3,000
D= 0.9*3,000

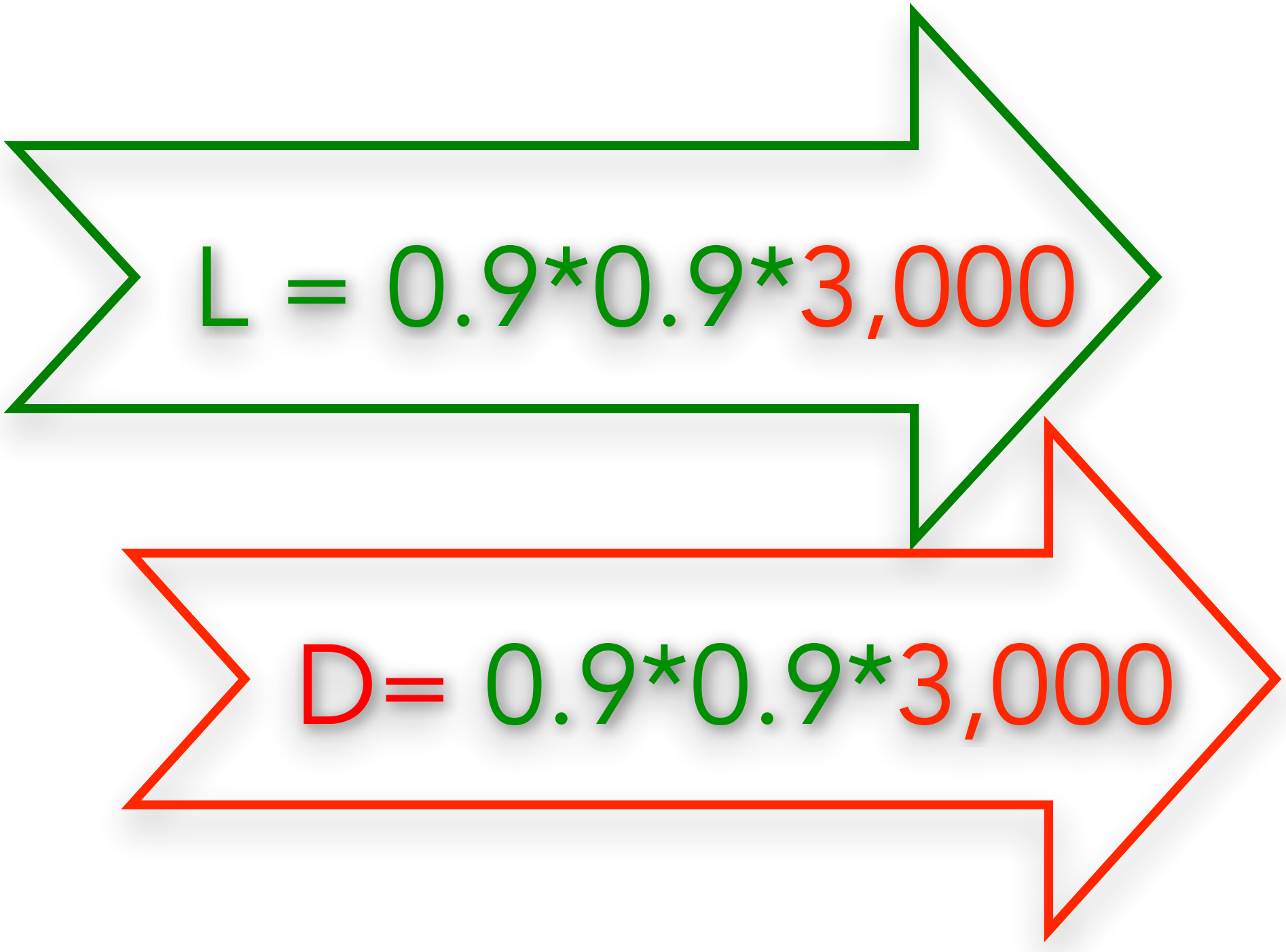

Bank C


Bank D


Bank E

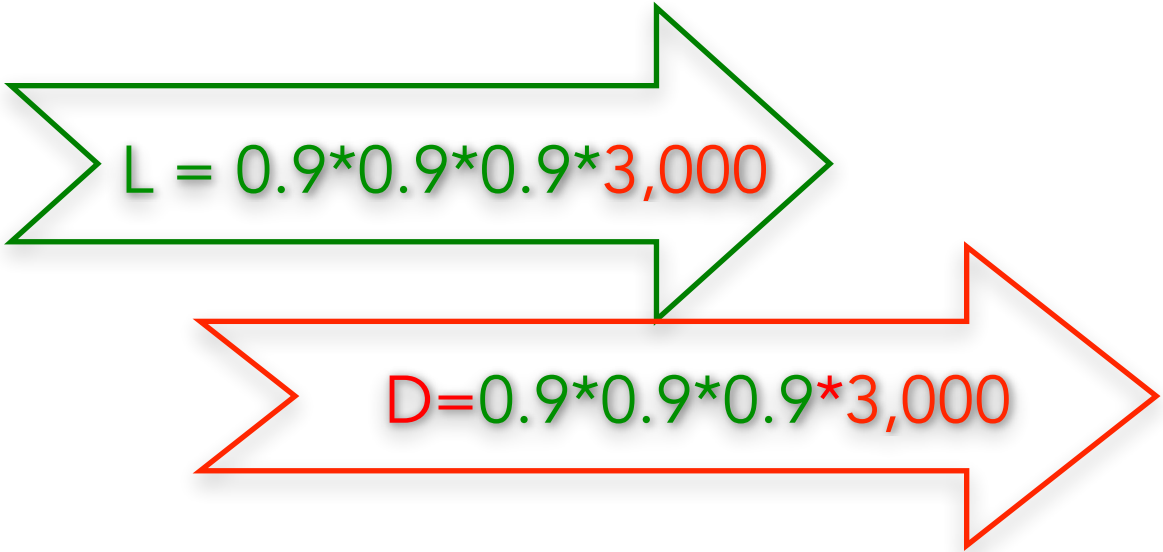

Bank F

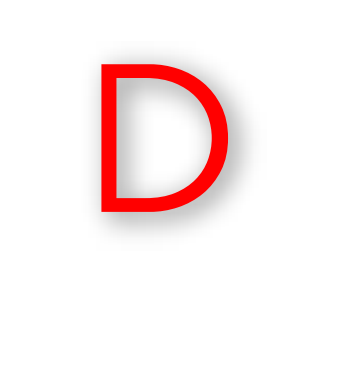
D =3,000


L = 0.9*0.9*3,000
D= 0.9*0.9*3,000

3


0


L = 0.9*0.9*0.9*3,000
D=0.9*0.9*0.9*3,000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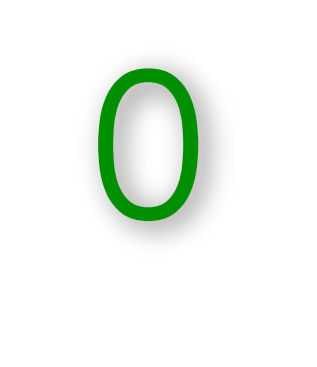
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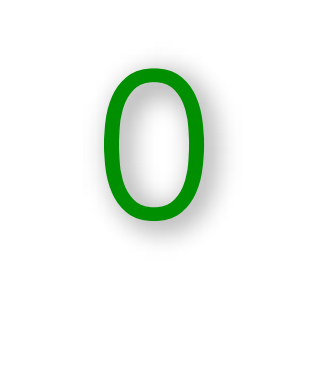
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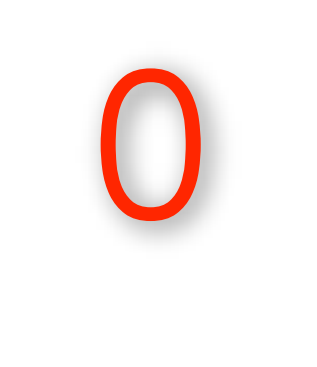
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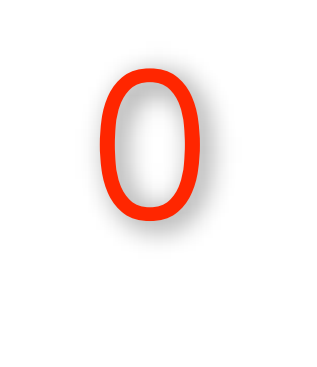
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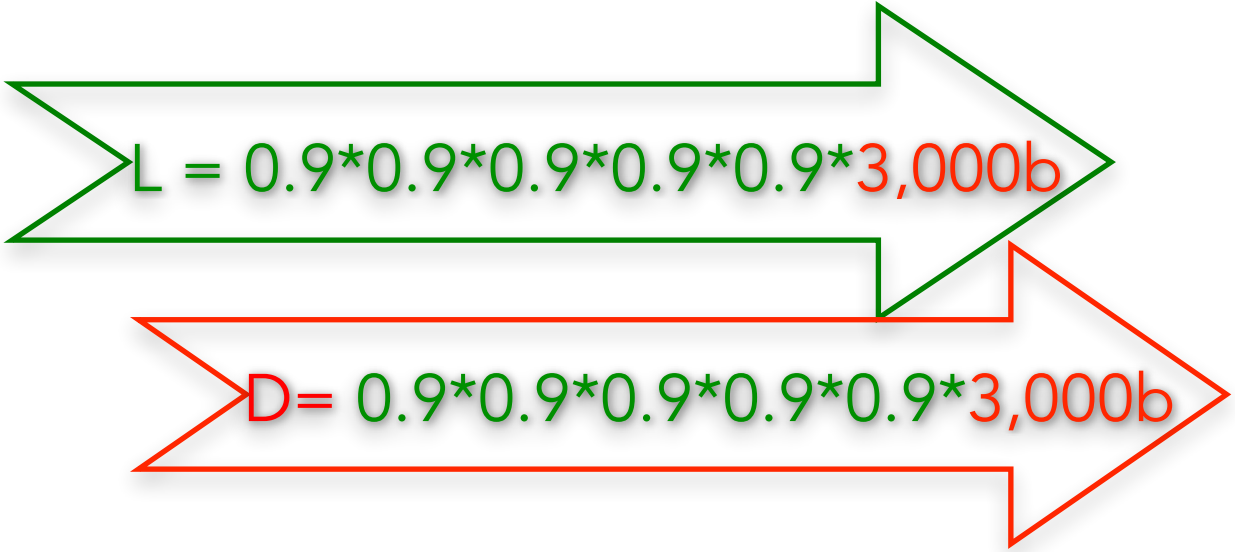
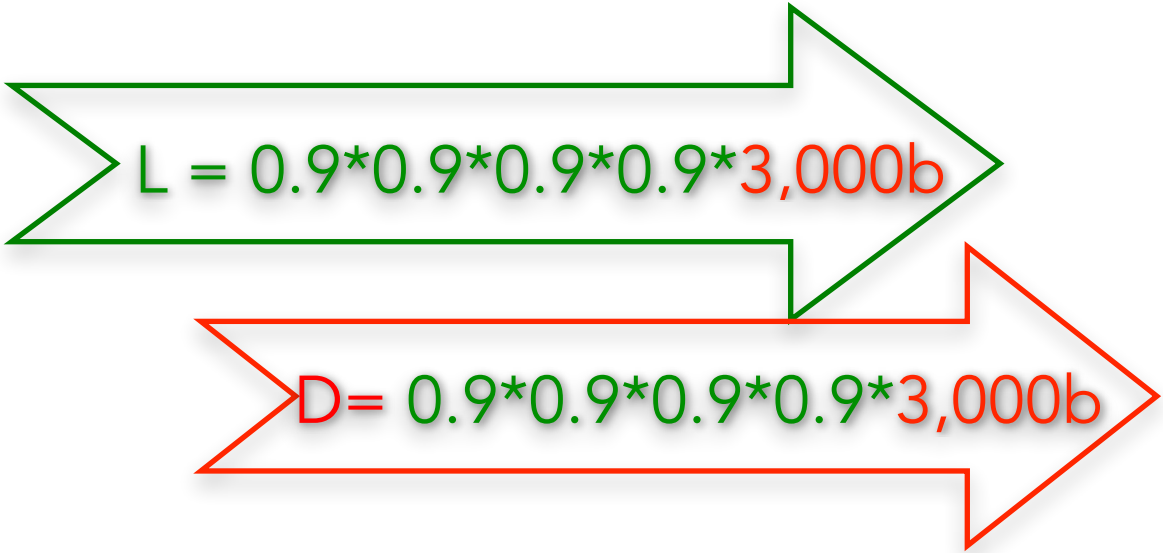

L = 0.9*0.9*0.9*0.9*0.9*3,000b
D= 0.9*0.9*0.9*0.9*0.9*3,000b

D= 0.9*0.9*0.9*0.9*3,000b


L = 0.9*0.9*0.9*0.9*3,000b
D= 0.9*0.9*0.9*0.9*3,000b

$$D = 0.9*0.9*0.9*0.9*0.9*3{,}000b$$

0.1*3,000


+0.1*0.9*3,000

$$+ 0.1 * 0.9 * 0.9 * 3{,}000$$

$$+ 0.1 * 0.9 * 0.9 * 0.9 * 3{,}000$$

$$+\ 0.1*0.9*0.9*0.9*0.9*3{,}000$$

$$+\ 0.1*0.9*0.9*0.9*0.9*0.9*3{,}000$$

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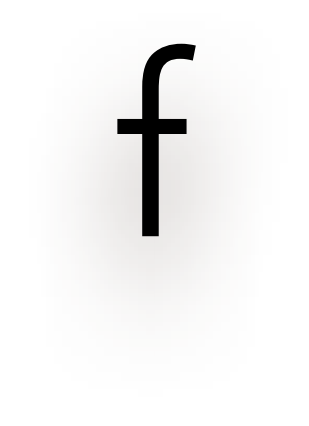

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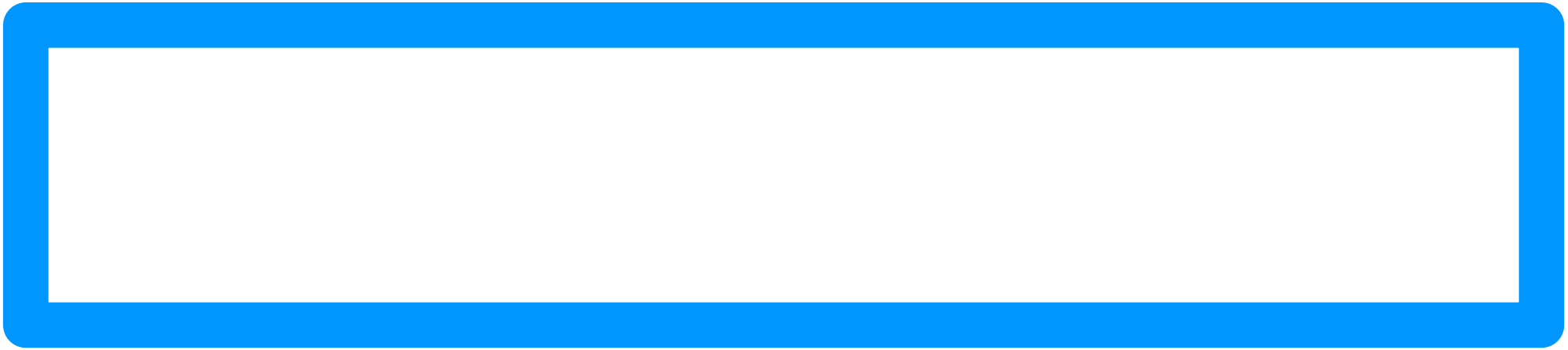
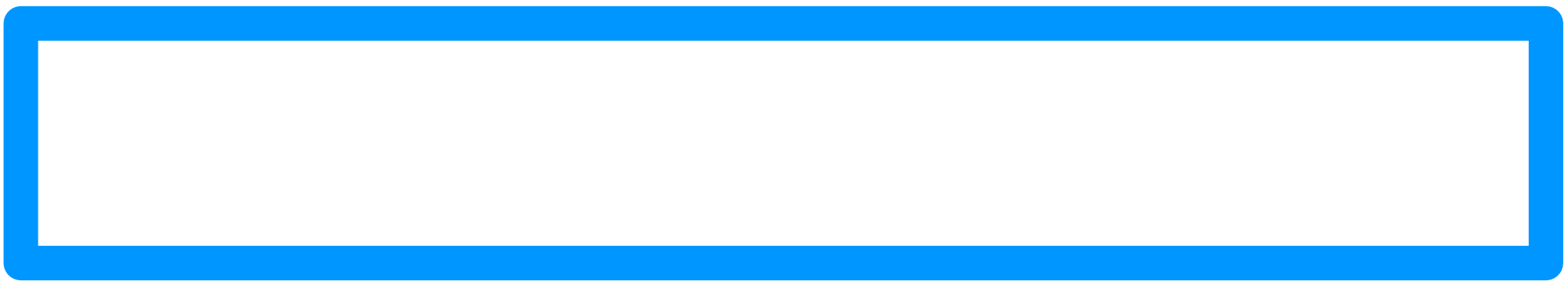
Total new Reserves in all banks





Factor out 0.1*3,000

0.1*3,000 (1

+ 0.9

$$+ \ 0.9 * 0.9$$

+ 0.9*0.9*0.9

+ 0.9*0.9*0.9*0.9*0.9

+ 0.9*0.9*0.9*0.9*0.9

+ 0.9

$+0.9^2$

$$+ \ldots 0.9^{n})$$

$+0.9^3$

$+0.9^{4}$

$+0.9^5$

$+0.9^{6}$

$$\Delta R = 0.1 * 3{,}000$$


1
1 - 0.9

A 3,000b injection of new money into the banking system, increase total Reserves by 3,000b

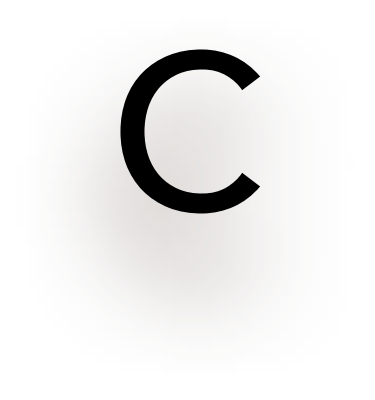
e

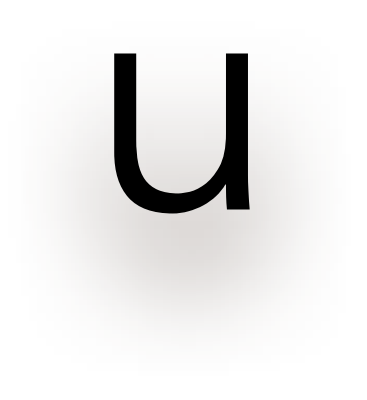
t

S

C

a


C



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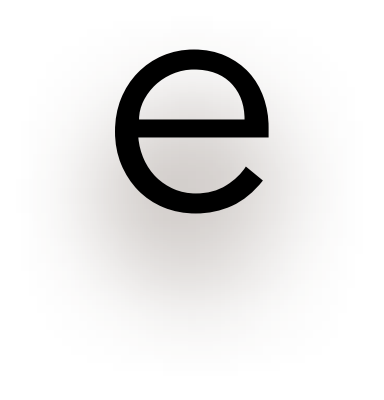
e

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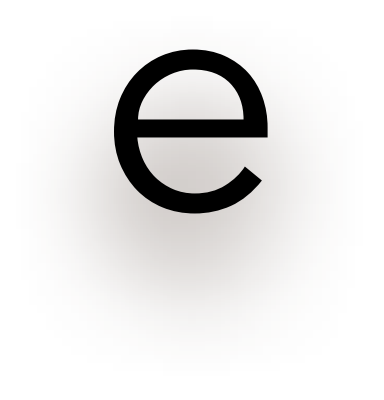

e

y


R

Banks must keep **10%** of Deposits in Reserves

$$R = 0.1 * 3{,}000$$

$$R = 0.1 * 0.9 * 3{,}000$$

$$R = 0.1 * 0.9 * 0.9 * 3{,}000$$

$$R = 0.1 * 0.9 * 0.9 * 0.9 * 3{,}000$$

$$R = 0.1 * 0.9 * 0.9 * 0.9 * 0.9 * 3{,}000$$

$$R = 0.1 * 0.9 * 0.9 * 0.9 * 0.9 * 0.9 * 3{,}000$$

0.1*3,000 (1

$$\Delta R = 3{,}000$$


0.1
1- 0.9

$$\Delta R = 3{,}000$$


0.1
0.1

$$\Delta R = 3{,}000$$


(1)

Banks must keep **10%** of Deposits in Reserves


Banks must keep
10% of Deposits in
Reserves

Let’s calculate now Total Reserves generated by the new money: ΔR

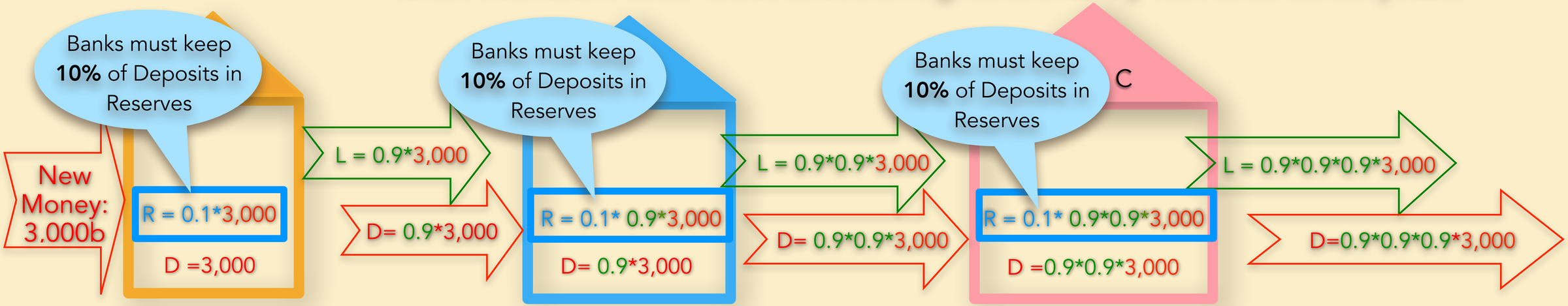
$$D = 0.9 * 3{,}000$$

$$D = 0.9 * 0.9 * 3{,}000$$

$$D=0.9*0.9*0.9*3{,}000$$

+… this process continues for several rounds

Let's calculate now Total Reserves generated by the new money: ΔR



Total new Reserves in all banks $\Delta R = 0.1*3{,}000 + 0.1*0.9*3{,}000 + 0.1*0.9*0.9*3{,}000 + 0.1*0.9*0.9*0.9*3{,}000 + 0.1*0.9*0.9*0.9*0.9*3{,}000$

$+ 0.1*0.9*0.9*0.9*0.9*0.9*3{,}000 + \ldots$ this process continues for several rounds

Factor out $0.1*3{,}000$

$$\Delta R = 0.1*3{,}000\,(1 + 0.9 + 0.9*0.9 + 0.9*0.9*0.9 + 0.9*0.9*0.9*0.9 + 0.9*0.9*0.9*0.9*0.9 + \ldots)$$

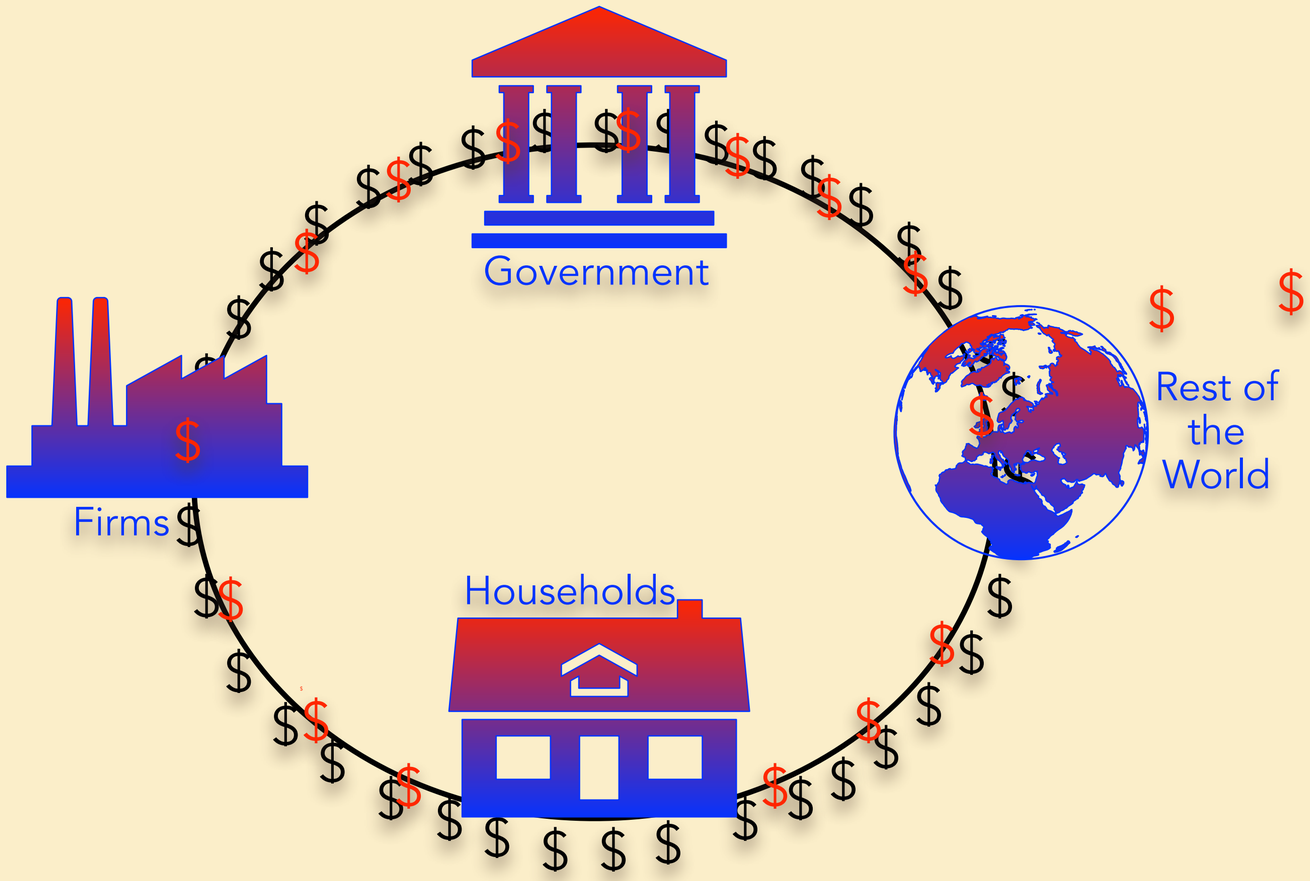
$$\Delta R = 0.1*3{,}000\,(1 + 0.9 + 0.9^2 + 0.9^3 + 0.9^4 + 0.9^5 + 0.9^6 + \ldots 0.9^n)$$

$$\Delta R = 0.1*3{,}000\left(\frac{1}{1-0.9}\right) \qquad \Delta R = 3{,}000\,(1)$$

$$\Delta R = 3{,}000\left(\frac{0.1}{1-0.9}\right)$$

$$\Delta R = 3{,}000\left(\frac{0.1}{0.1}\right)$$

A 3,000b injection of new money into the banking system, increase total Reserves by 3,000b



The Federal Reserve Bank creates new money