

hw 4 solution

3. Let's first analyze the buy back. Denote the amount of debt the government can buy back with its 10 units of international reserves by x . The expected payment is $(100-x)/2+50/2 = 75-x/2$. The price once the buy back is announced becomes $(75-x/2)/(100-x)$. To obtain x note that 10 buys x at the new price, ie $10 = ((75-x/2)/(100-x))x$, so let's solve this quadratic equation. The equation can be rewritten as $x^2 - 170x + 2000 = 0$ and the two roots are $85 \pm \sqrt{85^2 - 2000}$. Since the larger root is greater than 100 (and we cannot buy back more debt than there is) $x = 12.72$. The bottomline for the buy back is expected payments of $75 - 12.72/2 = 68.64$ plus the 10 paid for the buy back, that is a grand total cost of 78.64.

a) Without the buy back the expected payments, when creditors don't have access to the reserves, are $100/2 + 50/2 = 75$. Obviously this is less costly so the country chooses not to undertake the buy back.

b) If creditors have access to the reserves the expected payments for the no buy back case become $100/2 + 60/2 = 80$. Here the buy back is preferable.