The abc theorem of finance

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Abstract

In this paper, I describe the abc theorem of finance and nine solutions.
The paper ends with "The End"

Introduction

The abc theorem of finance is an extremely powerful theorem.
In this paper, I describe the abc theorem of finance and nine solutions.

The abc theorem of finance

The abc theorem of finance states that there exist expressions a, b and c such that

$$1 = a\frac{P\left(1+r_f+p_e-cp_l\right)}{E\left(1+r_f-p_e+cp_l\right)} + b\ln\left(\frac{P\left(1+r_f+p_e-cp_l\right)}{E\left(1+r_f-p_e+cp_l\right)}\right)$$

where

P is the price of a stock
E is the earning of the stock
r_f is the risk-free rate
p_e is the equity risk premium
p_l is the liquidity risk premium
a and b are the coefficients
c is the control

Below, I describe nine solutions to the abc theorem of finance.

The first solution to the abc theorem of finance

The first solution to the abc theorem of finance is

$$a = 1$$

$$b = 1$$

Suitable c

$$r_f = \frac{(P+E)W(e^{P-c})}{2P} - 1$$

$$p_e = \frac{bEW\left(\frac{ae^{\frac{P-c}{b}}}{b}\right) - aP\left(1+r_f\right)}{aP}$$

$$p_l = 0$$

The second solution to the abc theorem of finance

The second solution to the abc theorem of finance is

Suitable b
Suitable c

$$a = \frac{E\left(1+r_f-p_e+cp_l\right)}{P\left(1+r_f+p_e-cp_l\right)}\left(1-b\ln\left(\frac{P\left(1+r_f+p_e-cp_l\right)}{E\left(1+r_f-p_e+cp_l\right)}\right)\right)$$

The third solution to the abc theorem of finance

The third solution to the abc theorem of finance is

Suitable a
Suitable c

$$b = \frac{(1+r_f)(E-aP)-(p_e-cp_l)(aP+E)}{E(1+r_f-p_e+cp_l)\ln\left(\frac{P(1+r_f+p_e-cp_l)}{E(1+r_f-p_e+cp_l)}\right)}$$

The fourth solution to the abc theorem of finance

The fourth solution to the abc theorem of finance is

$$a = 1$$

$$b = 0$$

$$c = \frac{(P+E)p_e-(E-P)(1+r_f)}{(P+E)p_l}$$

The fifth solution to the abc theorem of finance

The fifth solution to the abc theorem of finance is

$$a = 1$$

$$b = \frac{(P+E)p_e+(P-E)(1+r_f)}{E(p_e-1-r_f)\ln\left(\frac{P(1+r_f+p_e)}{E(1+r_f-p_e)}\right)}$$

$$c = 0$$

The sixth solution to the abc theorem of finance

The sixth solution to the abc theorem of finance is

$$a = 0$$

$$b = 1$$

$$c = \frac{(eE+P)p_e-(eE-P)(1+r_f)}{(P+eE)p_l}$$

The seventh solution to the abc theorem of finance

The seventh solution to the abc theorem of finance is

$$a = \frac{E(p_e-1-r_f)}{P(1+r_f+p_e)}\left(\ln\left(\frac{P\left(1+r_f+p_e\right)}{E(1+r_f-p_e)}\right)-1\right)$$

$$b = 1$$

$$c = 0$$

The eighth solution to the abc theorem of finance

The eighth solution to the abc theorem of finance is

$$a = 0$$

$$b = \frac{1}{\ln\left(\frac{P(1+r_f+p_e-p_l)}{E(1+r_f-p_e+p_l)}\right)}$$

$$c = 1$$

The ninth solution to the abc theorem of finance

The ninth solution to the abc theorem of finance is

$$a = \frac{E\,(1+r_f-p_e+p_l)}{P\,(1+r_f+p_e-p_l)}$$

$$b = 0$$

$$c = 1$$

The End