Bi-stable model of risk interest rate.

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Variables θ – an amount of dept per unit of productive capital, $\bar{\theta} = 1\text{-}\theta$ – own capital, variable θ is slow, r - risk, $\hat{r} = \frac{r}{d}$ - normalized risk. b - risky bank interest rate $b = b_0 + r$, where b_0 - risk less interest rate: for the sake of simplicity $b_0 = 0$, and thus $b = r$.

Parameters. τ - time of refinance of debt, i_F - internal rate of return of capital, i_{ob} - internal rate of return of current capital, d – depreciation rate, ω – ratio of current capital to the total capital, $\varpi = 1 - \omega$ - ratio of long term capital to the total capital, $\sigma = i/d$ - dimensionless rate of return. If r - is an intensity of the Poisson flow of bankruptcy, than $t_b = r^{-1}$ - is an average time before the bankruptcy, at the level of risk rate r=b, time of bankruptcy may be estimated as a time of achieving of boarder where $\theta = \sigma + 1$ (or simply $\theta = 1$) $\frac{d}{dt}\theta = \theta b - (i_F + d) + \theta d$, let us suppose that the velocity of dept changing or growth is constant $v = \theta b - (i_F + d) + \theta d$, than, using $r = \frac{1}{t_b}$

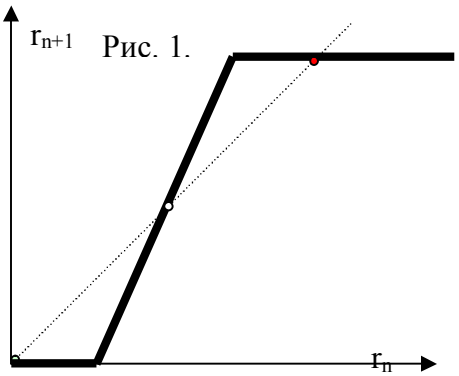

Рис. 1.

we obtain a discrete mapping of interest into itself $r_{n+1} = \frac{\theta}{1+\sigma_0-\theta} r_n - d$. Since risk is not negative one should be rewrited $r_{n+1} = \max(0, \frac{\theta}{1+\sigma_0-\theta} r_n - d)$. Risk interest rate should be bounded with $r_{\max} = ((\sigma + 1)\frac{1}{\omega} - 1)d$, - the rate of return of current assets: $r_{n+1} = \min(\max(0, \frac{\theta}{1+\sigma_0-\theta} r_n - d), r_{\max})$. Equilibriums are the following $r = r_{\max}$ - crisis, $r_{us} = \frac{1+\sigma_0-\theta}{2\theta-1-\sigma_0} d$ unstable & $r = 0$ is the preferable one. They meet $r_{n+1} = r_n$. There is no crisis equilibrium if $\sigma + 1 > \theta + \sqrt{\theta^2 - \omega\theta}$, at plane σ=0 this means that $\omega > 2 - \theta^{-1}$, - see curved line in Fig 2. Lower equilibrium is the main one or have hire potential when we see $\sigma > 2\theta - 1 - \omega$ or $\sigma > \bar{\omega} - 2\bar{\theta}$ (this is solution for condition $2r_{us} > r_{\max}$). One may consider it as a boarder of financial stability of economy & single enterprise.

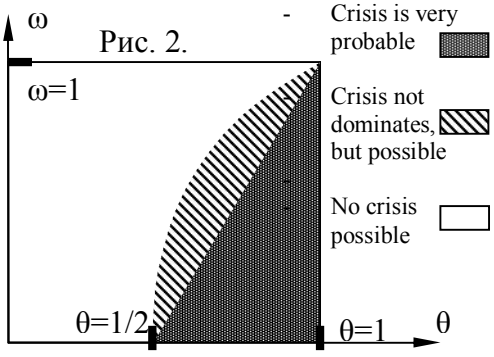

Рис. 2.