

## The Kelly Criterion and Credit Investing

In gambling, the Kelly Criterion is a formula that can be used to determine the optimal size of a series of bets (with the probability of winning or losing always the same, say at a particular game in a casino). This formula cannot be used productively if one plans to play a game only once.

According to the formula, the fraction,  $f$ , of one's resources that should be sensibly bet on a single play is

$f = (bp - q)/b$  where  $b$  is the odds received on a wager ( $b$  to 1, that is, you could win  $\$ (b+1)$  or lose  $\$1$ ,  $p$  is the probability of winning and  $q$  is the probability of losing (i.e.  $1-p$ ).

If a gambler has a 70% chance of winning in a particular play but he receives odds of 1 to 1 ( $b=1$ ), he should bet  $(1 \cdot .7 - .3)/1$  of his bankroll (i.e. 40%).

Edward Thorp, in his 1997 paper, "The Kelly Criterion in Blackjack, Sports Betting and the Stock Market" explained how the Kelly Criterion could be used in Equity Finance. It required the creation of a probability function for stock returns, but unless the whole framework is supplemented with tons of common sense, it is replete with pitfalls for the unwary.

### Kelly and Portfolio Sizing in the World of Credit

Does it make sense to use the Kelly Criterion in the world of credit? We present our *preliminary* views on Kelly and credit financing. We hope to provoke a debate on this, at the end of which we might be able to conclude the following a) does it make sense to use the criterion in the world of credit or is it needless and pointless complexity which adds very little value? b) if the answer to a) is yes, what modifications must be done to the framework to make it useful c) if the answer to a) is yes, what are the many ways in which the criterion can be used.

One clear way to use the criterion (in our opinion, and we are more than ready to change our mind) is to estimate the percentage of your portfolio that should be in different classes of

lending- that is how much of your portfolio should be in government lending (subscription to treasury bonds), industrial lending, real estate development lending, credit card lending, mortgage lending, retail auto sector lending etc. And the way you do that is avoiding sectors for which the market gives you unfavorable odds (say US treasury bonds) and embrace lending to those sectors where the expected default, based on past data under stress conditions as well as adjustment for the “new normal”, is likely to be lower than what a panicked market might imply.