

# On fear and hope

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Let me pose a question in the beginning,

**Q:** *Choose an integer number from 0 to 10, the equivalent amount of which you might gain or lose.*

Let us visit possible answers to this question. It is easy to see that 0 is the safest choice, someone who doesn't want to take any risk will take this option. This option maximizes fear and minimizes hope. On the other hand an adventurous person might opt 10 which maximizes hope. This option is for the fearless guy who is willing to take risk. A reasonable option for a person who is neither extremely fearful nor adventurously hopeful would be to choose 5. This option balances the elements of fear and hope. We call this choice a natural one. At time instant  $t_1$ , given all the ten possible options an unbiased normal person would definitely take option 5 (with probability of 5 at  $t_1$  equals to 1). If a second person has to choose at time instant  $t_2$  from the knowledge of the system at time  $t_1$  she/he would have two equally probable options 4 and 6, as option 5 was definitely preoccupied (with probability of option 4 and 6 at  $t_2$  equals to  $\frac{1}{2}$  each and probability of option 5 at  $t_2$  equals to 0). We propose following axioms,

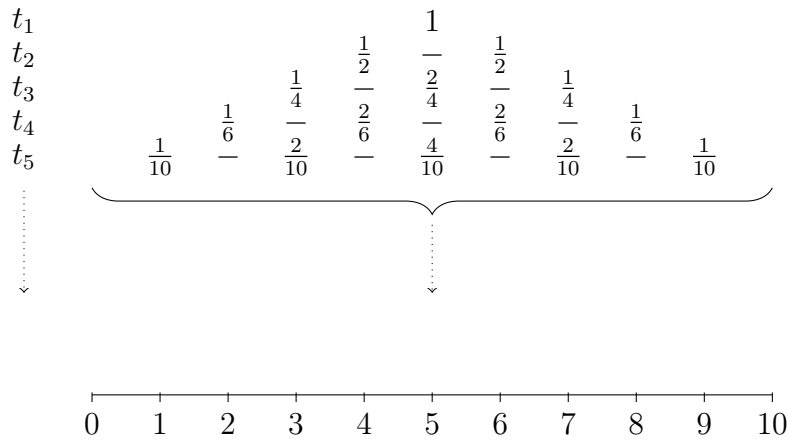
- slots available at  $t_n$  are definitely not available at  $t_{n+1}$
- trust factor is highest at a slot closest to the mean value, however it becomes half at each available slot away from the mean value in both directions
- at each step only one previously unattempted slot can be explored on both sides

based on above three axioms a flow chart for 10 slots and discrete number of times instances can be drawn as shown in figure 1. However as time instances and number of slots go to infinity large the probability density function ends up as a nice bell curve as shown in figure 2. This bell curved distribution is known as normal distribution and it is the most frequently in nature. Many statistical and physical variables are nearly normally distributed from quantum

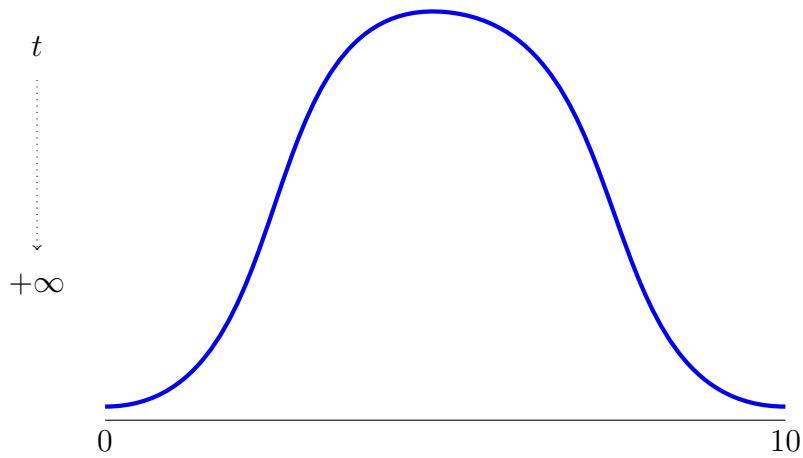
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**Figure 1:** Natural choice on the basis of fear, hope and availability of slots (resources).



**Figure 2:** As time instances and number of available slots go to  $\infty$ .

scale to distribution of human heights, introversion and job satisfaction. This exercise shows that fear and hope are naturally ingrained in the universe. The safest bet is the one that balances both fear and hope.