

Better Results From Wrong Decisions

How many times do we have to make a stab in the dark, when we have to make a decision when we don't - and can't - know all the facts? "Decision making under conditions of uncertainty" may not be a phrase that springs to everyone's mind, but I'm sure that we all recognize the situation.

Practical application of a well-known statistical theory - the 'minimax regret theory' - could help here. Basically, what this theory says is that you assume that whatever decision you make will be the wrong one. You then try to minimise the 'regret' that you will have for making the wrong decision.

Here's a very simple example. You do not know if it is going to rain today, but you need to decide whether or not to take your umbrella with you. If you don't, and it rains, you will get wet. If you do, and it doesn't rain, you will have had the inconvenience of carrying the umbrella round all day. So, given that you will make the wrong decision, which will you regret the most? (Don't ask me to decide for you!)

In our business lives, too, we are faced with many similar uncertain conditions. For example, do we spend a certain some of money on a new machine - or on extra marketing? Which would bring in more profit? We don't know. If we spend it on the marketing would we regret not having the competitive edge that the new machine would bring us. Or, if we had the new machine, could we sell its output without the extra marketing?

Suppose we had decided that the competitive edge of the new machine was not very important, and that the extra marketing was - and suppose we were wrong; the marketing was not successful and our competitors stole a march on us with their new machine. How much would we regret that in comparison with...

...when we bought the new machine, and our competitors (with their old machines) gained market share because they had spent more money on advertising and promotion?

Minimax regret does not give instant solutions to this type of decision making, because often we cannot quantify the possible outcomes. But it does give us another rational way of making decisions.

If you're not into number-crunching, then you can stop reading here. But if you would like a numerical example of minimax regret theory, then read on...

Here's another business situation, this time with some numerical assumptions. You are going to do a direct mail shot. You don't know what the response rate will be - 5%? 2%? 1%? Should you mail out 10,000, 1,000 - or 100. You know that you will only have the chance to do one mailshot, because after that, your competitors will move in and take over your idea. I won't bore you with all the calculations here, (you can check my arithmetic if you like) but assume that it costs \$3.00 for each mailshot, and your income per sale (before the mailing costs) is \$100.00 (for dollars, read your own currency!)

On these assumptions, if you mail out 10,000, and you only get a 1% response, your loss will be \$20,000 - compared with a loss of only \$200 if you had mailed out just 100. So your maximum regret for this action - the big mailout - is \$19,800.

Similarly, if the response had been 5%, and you'd opted for the 100-mailshot, your income would only have been \$200, as compared with \$20,000 if you'd mailed all 10,000. Again, a 'regret' of \$19,800

But if you'd mailed out 1,000, with a 5% response, your income would have been \$2,000, as compared with the \$20,000 from the 10,000 mailshot - a 'regret' of \$18,000 - lower than the \$19,800 'regrets' of the other two actions. ('Regrets' for the 2% and 1% outcomes are much smaller). So this is the course of action you would go for, because it minimizes the maximum regret.

Intuitively, if you had assumed the worst, you would have gone for the smallest mailout. But 'minimax regret' shows that this would have been the wrong course of action. Often, when you are able to make some sort of numerical estimate of the possible outcomes, a spreadsheet model can speed up the number crunching considerably. An even better management tool is 'hindsight', better known as 'being wise after the event'!

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