Prediction Market Myths

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Summary

Three myths about Prediction Markets (PMs): First, that they are a single, independent, predictive tool (when they are in fact a meta-tool). Second, that their accuracy can be assessed by comparing market prices or anticipated outcomes with those of other forecasts (this fails to measure accuracy). Third, and most ambitious, that it is possible to disagree with the market price.

1 – The Tool Myth

The belief that a Prediction Market is an independent tool to be compared with a different independent forecasting tool.

Examples:

- "According to Study X, PMs are not as accurate for predicting election results as polls".
- "How can PMs work as well as an analysis conducted using refined statistical techniques?"
- "PMs incorporate "bad" data from manipulators or people who are just having fun, whereas the Delphi Method stands firmly on a vetted panel of world-class experts."
- "No forecast of Y could possibly work without directly utilizing a theory-laden model".
- "Election PMs contain a 'long-shot bias', and tend to overrate the changes of the trailing candidate."

These seemingly plausible arguments have ensnared many lazy thinkers. Though it may feel normal to treat PMs as a new tool to be compared with old tools, instead PMs are a meta-tool that can absorb the advantageous qualities of each existing tool (and reject their disadvantageous qualities). The very act of comparing a PM to any forecast result is as ridiculous as comparing a doctor to his stethoscope.

Observe the following figures, illustrating exogenous tools as simple circles, and a 'meta-tool' prediction market as a reactive shape bending to incorporate the best sources of evidence (the "PM Amoeba").

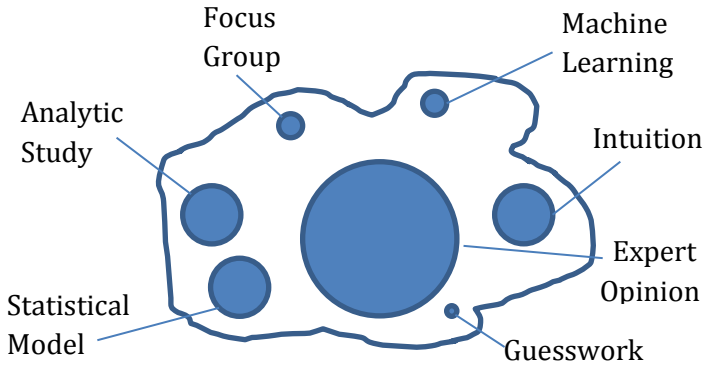

Figure 1. The PM Amoeba: not one tool but a synthesis of tools. Exogenous tools are represented by labeled circles.

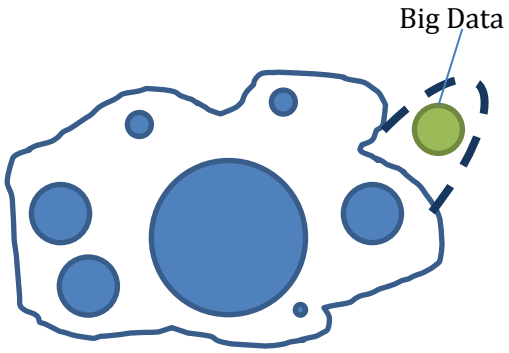

Figure 2. A new predictive tool is invented (ex 'Big Data'). As traders exploit the marginal benefits of this tool for profit, the tool's benefits become absorbed into the PM Amoeba.[1]

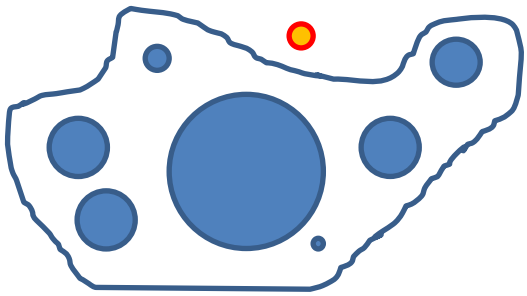

Figure 3. An existing technique no longer contributes meaningfully to this particular forecast, possibly because it is obsolete, redundant, or uneconomical. As traders stop using it, it becomes excluded from the PM Amoeba.

[1] PMs provide incentives for individuals to seek out and gather quality information, so PMs not only 'absorb' all currently available info-sources, but may also cause new info-sources to become available.

2 – The Empiricism Myth

The belief that certain phenomena count as evidence against the accuracy of PMs.

Examples:

- "This PM was predicting that something would happen, but it didn't happen. Therefore, PMs are inaccurate."
- "Source X (individual, research paper, statistical model, etc.) published a forecast that this event would occur, and did so before the PM reached that consensus. Therefore PMs are slower than Source X, which tracks the true probability more accurately."
- "I do not believe PMs are accurate because Source Y investigated PMs and concluded that they…"

Pre-outcome, the claim that one forecast method is better than another is epistemologically impossible. Phrases such as 'true probability' and 'most accurate forecast' are laughable.

Post-outcome, such claims are possible, but likely more difficult than the layperson may suspect. For a start, the front-runners (probability > 50%) should not always win. In fact, if they did, that would indicate that they were consistently underpriced, and be evidence against the accuracy of PMs.

PMs are unique to the forecasting world in that their operation and methodology are completely transparent and reproducible. Moreover, only PMs provide a publically available forecast at each moment of their existence, in contrast to a poll or research paper whose results are published one time on a single date. As such, PMs are immune to publication bias, as they can neither censor nor cherry pick their methodology or results. This immunity is highly significant, as publication bias causes roughly 60%[2] to 90%[3] (or more[4]) of the university-grade research-findings claimed to be true to actually be false. For individual bloggers, TV pundits, or journalists, or other info-prostitutes, who lack scientific training and the controls imposed by peer review, the effects of selective-publication can only be even more detrimental.

PMs are not accurate because they have a track record of accuracy. They are accurate because of qualities inherent to their definition as an incentive-compatible meta-tool. The accuracy is not a mysterious result, which "for some reason" we continue to observe empirically, and ultimately generalize by way of induction. The accuracy of a PM is produced by way of information-aggregation, in a completely clear and atomically understood process. If PMs are ever to be discredited, it can only be on the grounds that they fail to efficiently integrate some existing knowledge.

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[2] http://www.plosmedicine.org/article/info%3Adoi%2F10.1371%2Fjournal.pmed.0020124

[3] http://www.jove.com/blog/2012/05/03/studies-show-only-10-of-published-science-articles-are-reproducible-what-is-happening

[4] http://www.economist.com/news/briefing/21588057-scientists-think-science-self-correcting-alarming-degree-it-not-trouble

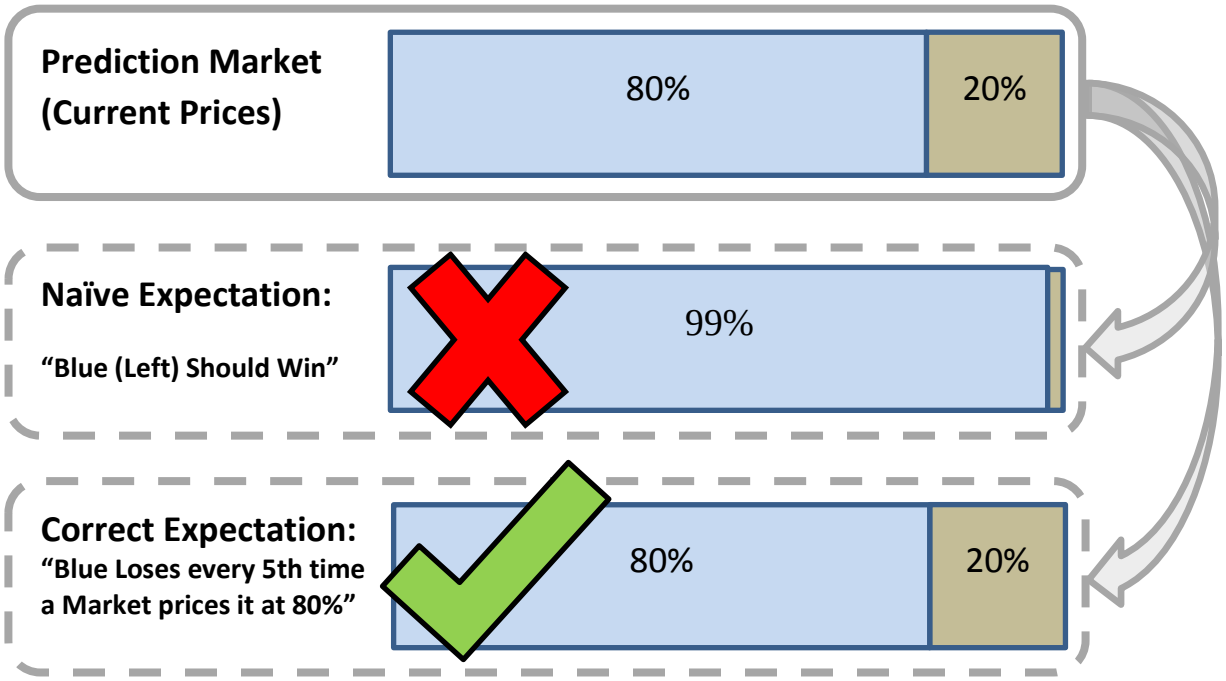

Figure 4. Three probability estimates (grey rounded rectangles), a prediction market (solid) and two interpretations of that market (dashed). This author has observed many critics (and champions) of prediction markets ascribe a 'magical inevitability' to any state trading above 50%. The red X indicates an incorrect expectation whereas the green check indicates the correct expectation.

3 – The Belief Myth

The belief that it is possible to disagree with the market price, or that individuals who claim to disagree with the market price are sincere in this belief.

Examples:

- "I see that the market claims that Candidate X's election chances are 40% but I believe that they are much higher."
- **"**I know that the current price is wrong, but I prefer not to trade (for Y reason)."

It is almost impossible for rational individuals to hold a belief that the current market price does not represent the most accurate assessment of the likelihood of the underlying state. Individuals who are knowledgeable but averse to trading can partner with an uninformed trader for mutual profit. Therefore, those who do have the potential to reasonably disagree with the market price must meet one of the following criteria:

1. They believe that the PM will be incorrectly administered (one or more rules will be broken, or funds will be stolen).
2. They are too poor to have any access to money or credit of any kind. They have no non-wealthy friends, no credit opportunities at banks, and no ability whatsoever to establish a relationship with potential investors of any kind (familial, professional, institutional).
3. They prefer having less money to having more money (UNICEF donation link).

Regarding criterion 2, it is difficult (but not impossible) to imagine someone at the required level of financial and social destitution as having new information to contribute to most forecasts. Most importantly, the individuals falling for this myth almost never match any of the 3 features at all.

What could explain the existence of people who claim to disagree with the market price, and yet do not meet the above criteria? I suggest that these individuals lack the self-awareness required to determine the reason that they neither want to trade nor accept the current market price as accurate. Humans have a very limited ability to understand their own beliefs[5][6][7][8] and even explain their own decisions.[9][10][11] 'Making excuses' can be much more comfortable than admitting the truth: that one does not have meaningful knowledge to contribute.

Interestingly, the individuals who, knowingly or otherwise, exploit 'cheap talk' to fill our conversations with nonsense are likely to be the same individuals who would fail to understand why a

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[5] http://en.wikipedia.org/wiki/Introspection_illusion
[6] http://www.overcomingbias.com/2010/03/homo-hipocritus.html
[7] ftp://ftp.gate.cnrs.fr/RePEc/2012/1216.pdf
[8] http://en.wikipedia.org/wiki/List_of_cognitive_biases
[9] http://www.youtube.com/watch?v=Ntnua6TRue4 (emphasis 5:53)
[10] http://www.overcomingbias.com/2013/05/do-you-want-to-be-honest.html
[11] http://en.wikipedia.org/wiki/Default_effect_(psychology)

prediction market would reveal and counter the problems of cheap talk, as those lacking competence in a cognitive skill tend to also be unaware of this incompetence. This is because the skills required to succeed in a cognitive task tend to be the same skills required to assess one's performance on that task.[12]

Finally, those who reject the very act of prediction on epistemological grounds can trade toward a uniform distribution (by purchasing the cheapest share until all shares the same price). If they are correct that the predictions made by the marketplace are meaningless, they will profit as a sheer matter of statistical expectation.

If transaction costs are low, it is a logical requirement that PMs produce the single most accurate integration of all existing human knowledge.

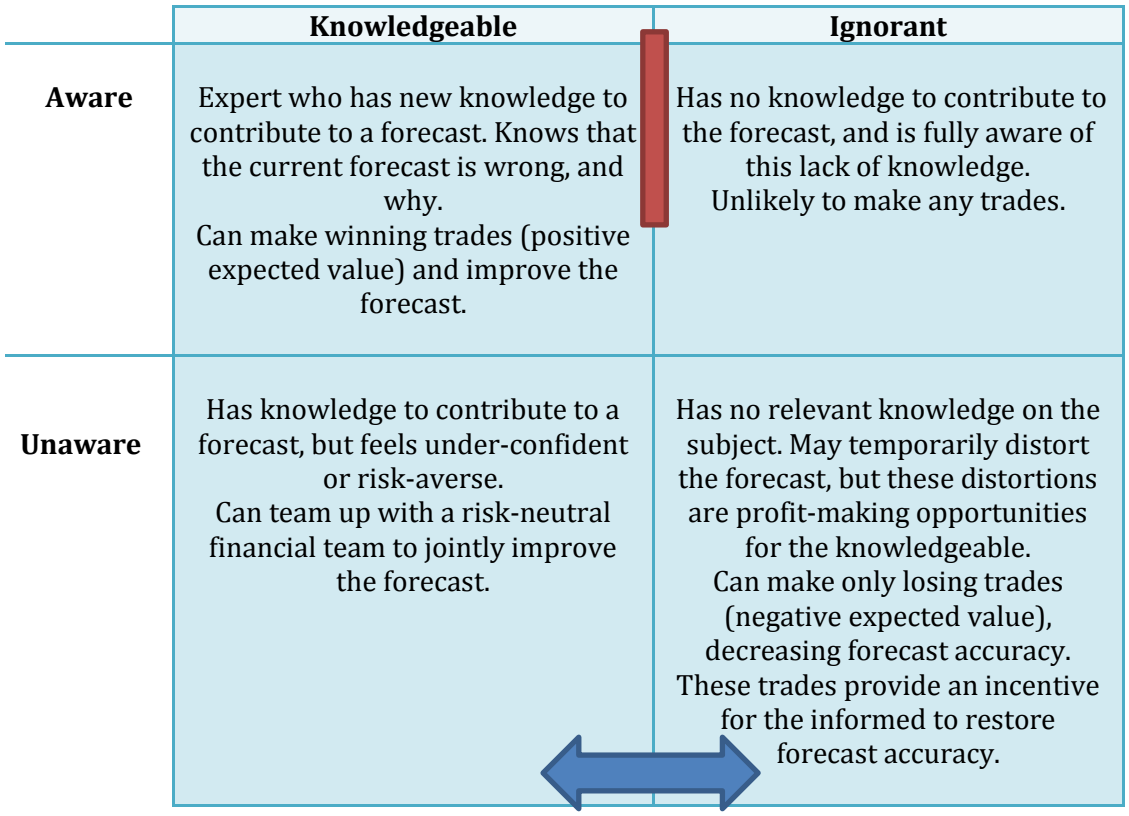

Figure 5. A table partitioning the agents of a Market (traders, onlookers, commentators) into types based on their personal knowledge of the outcome (horizontal axis) and level of awareness of that knowledge (vertical axis). Individuals with high awareness will know their location in the table (and trading strategy), but those with low awareness will be unable to determine their location (arrows), and are likely to also be 'meta-unaware' (unable to determine if they are Aware or Unaware).

[12] http://en.wikipedia.org/wiki/Dunning%E2%80%93Kruger_effect