Still Agile?
Back to the Future 5 years on…..

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Agile Forces Study

- This study was originally carried out to support the last SDSR in 2010, with the work being carried out by a small team at Dstl including myself (working as a contractor), Jim Moffat, Stuart Taylor and Tom Scales
- Work on the study was done in FY08/09 and FY09/10, with a presentation being given to XXVI ISMOR in September 2009 on the results of the 1st year of the study
- A second presentation was made to the Historical Analysis in Defence Symposium covering the results of the 2nd year of the study

The Approach

- The approach used was to take ideas from the world of complex systems and to look at the conflict environment as a space within which conflicts could be located.
- The dimensions for this conflict space were taken from the then DCDC 5 dimensions of conflict – Military, Resource, Technology, Social and Political.
- Measures were identified for these dimensions and the conflicts were plotted in the conflict space to identify whether there were any exploitable patterns to the resulting distribution of conflicts.
- The work also allowed defence planning scenarios to be plotted in the same space and the distributions of the artificial and real conflicts compared.

Back to the Future

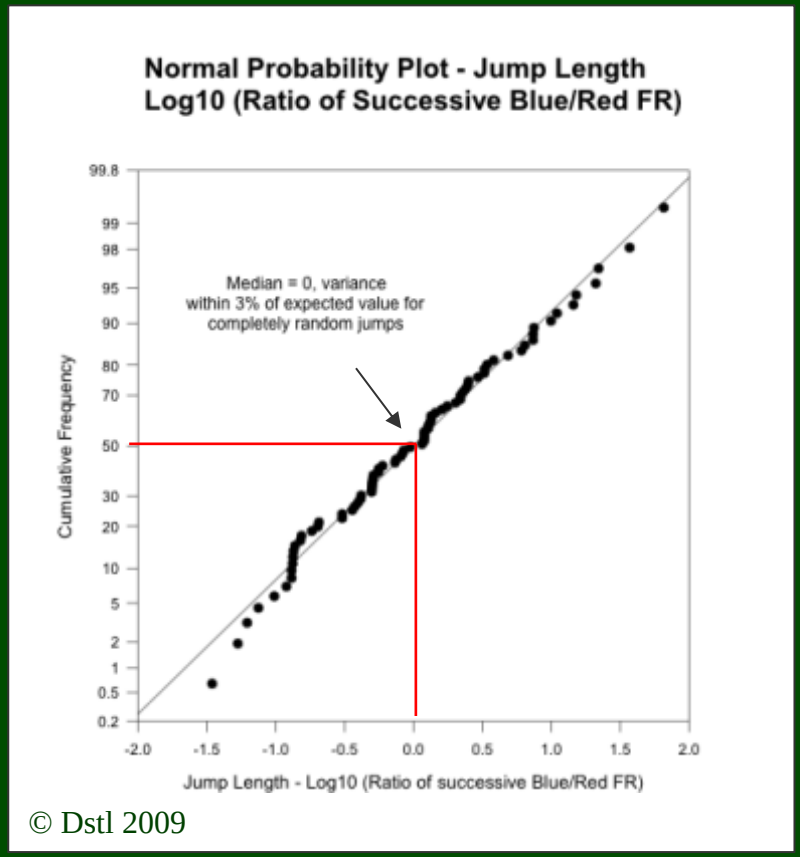
- The question this presentation will address is to see how the approach of using quantitative methods to characterise the likely nature of future conflict has fared in the 5 years or so since the work was first carried out.

Structure

- We will look at three aspects of the results presented to decision makers in 2009 and 2010.
- These are, in increasing order of courage:
  - Themes
  - Trends
  - Predictions

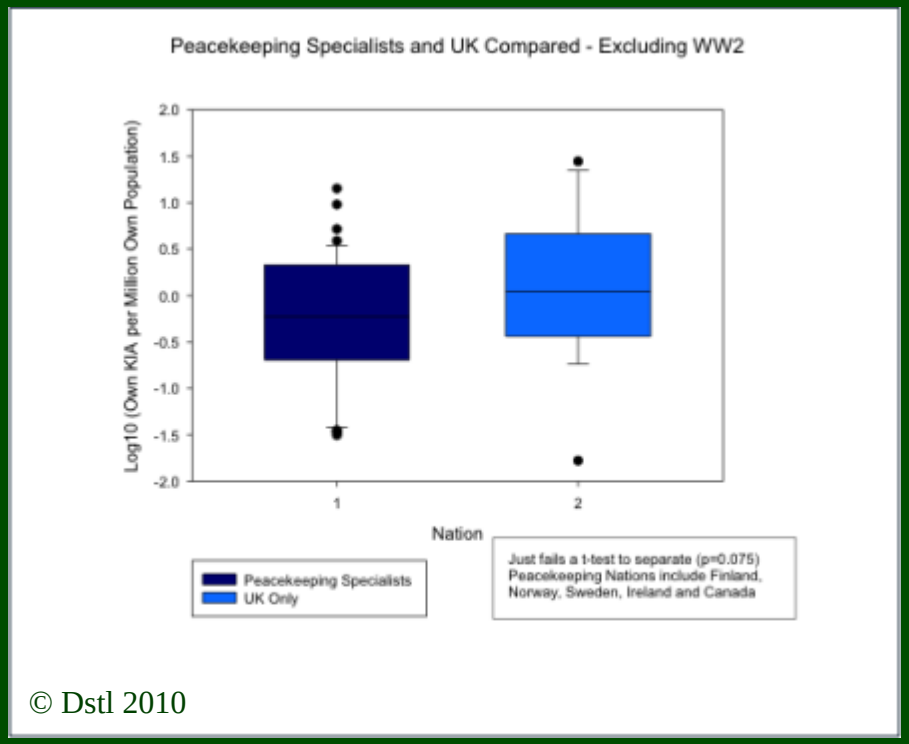
Theme 1 - Randomness

- By almost any measure we could devise, the nature of conflict seemed to be profoundly random.
- Conflicts arrived by a Poisson process, showed exponentially distributed durations and seemed to be positioned at random in the space, with little or no influence from the previous conflict in the sequence.



Theme 2 – Indifference to Policy

- A second theme was the indifference of the universe to stated defence policy.
- Policy had very little observable influence on this randomness, with only very radical foreign policy changes affecting the frequency or nature of conflicts – a constitutional prohibition on armed conflict did seem to work however



How have Themes endured?

- Conflicts have occurred without much warning and with some indifference to the wishes of policy makers
  - Libya 2011
  - Mali 2013
- However, involvement in conflict has been avoided in Syria (so far)

Events, Dear Boy, Events

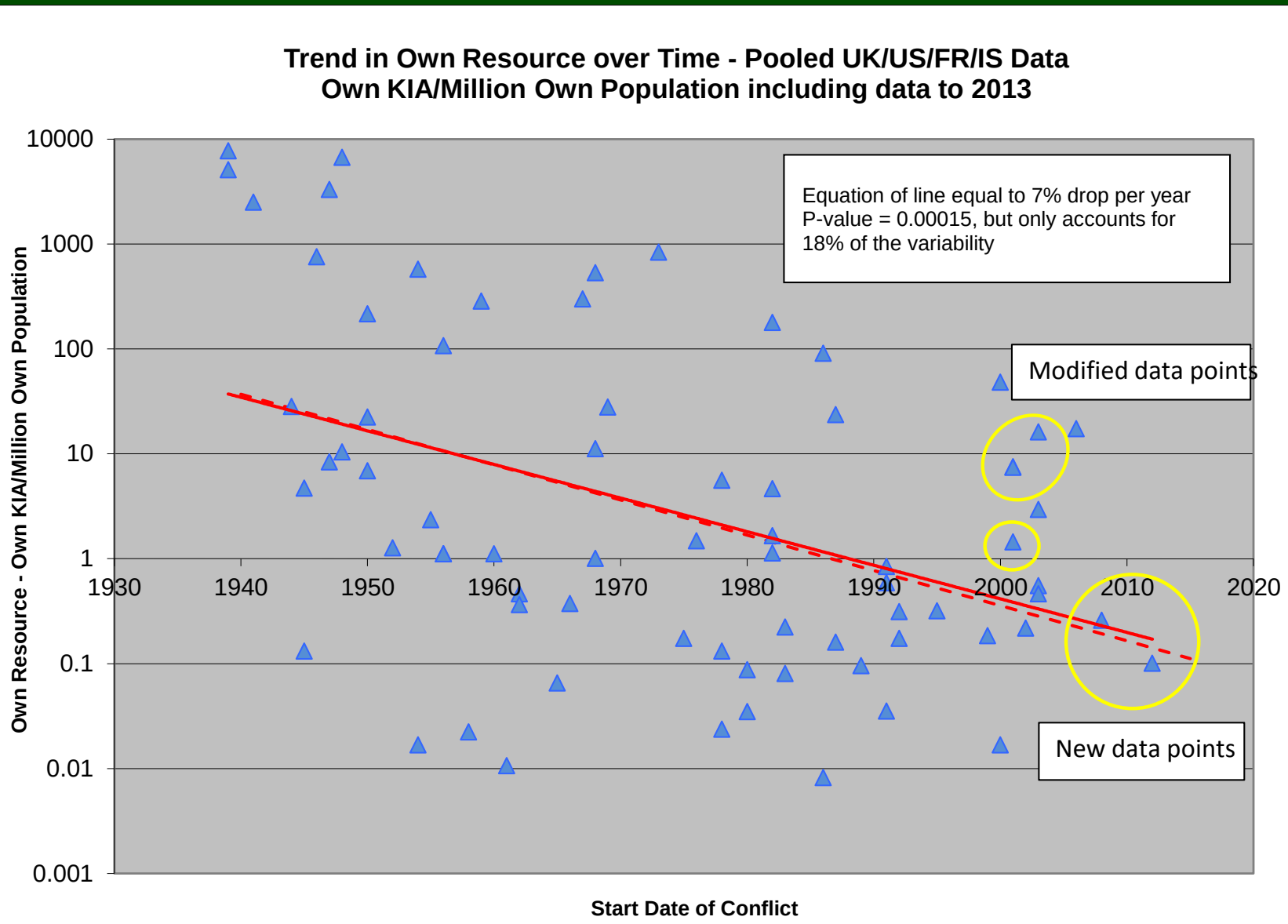
- The international system has continued to be driven by events beyond the control of UK policy makers
  - Arab Spring
  - Spread of AQIM in North Africa
  - Death of Kim Jong Il
  - US pivot to the Pacific

Trends

- Despite the overall randomness of the conflict space there were quantifiable trends in some of the dimensions
  - Resource – as measured in KIA/million population
  - Political – as measured in number of participants
  - Technology – as measured by relative age of equipment of participants
- There was also a significant non-trend in the social axis, as measured in the real GDP/capita of the conflict zone – the ‘dog that didn’t bark’ – more of this later
- How have these trends (or not) held up?

Trend 1 - Resource

- Our first trend was quite a sharp drop off in the intensity of conflict, as measured in the number of military KIA per million population of the participants.
- There was some scepticism about the extent of this trend, though a brief look at a longer timeline showed a version of the phenomenon going back to at least the late 18th century
- The last five years have seen a number of the conflicts in our dataset continue to rise in casualties, together with a number of new conflicts.
- How has this affected the trend line?


Trend in Own Resource over Time - Pooled UK/US/FR/IS Data
Own KIA/Million Own Population including data to 2013
Own Resource - Own KIA/Million Own Population
10000
1000
100
10
1
0.1
0.01
0.001
1930
1940
1950
1960
1970
1980
1990
2000
2010
2020
Start Date of Conflict
Equation of line equal to 7% drop per year
P-value = 0.00015, but only accounts for
18% of the variability
Modified data points
New data points

Other Evidence

- Since the study was carried out, an interesting book by Stephen Pinker – “The Better Angels of our Nature” has looked at long term trends in violence, bringing together an enormous mass of data from different sources.
- The conclusion of the book is that there is indeed a long term downward trend in interpersonal and interstate violence. There is even evidence of a downward trend in intrastrate violence, relative to population
- This trend goes back at least to the 17th Century, and probably back as far as hunter-gatherer societies, which have alarming levels of death by violence
- The same book also points out that LF Richardson also came across evidence of both Poisson distributions of conflicts and exponential distributions of duration.

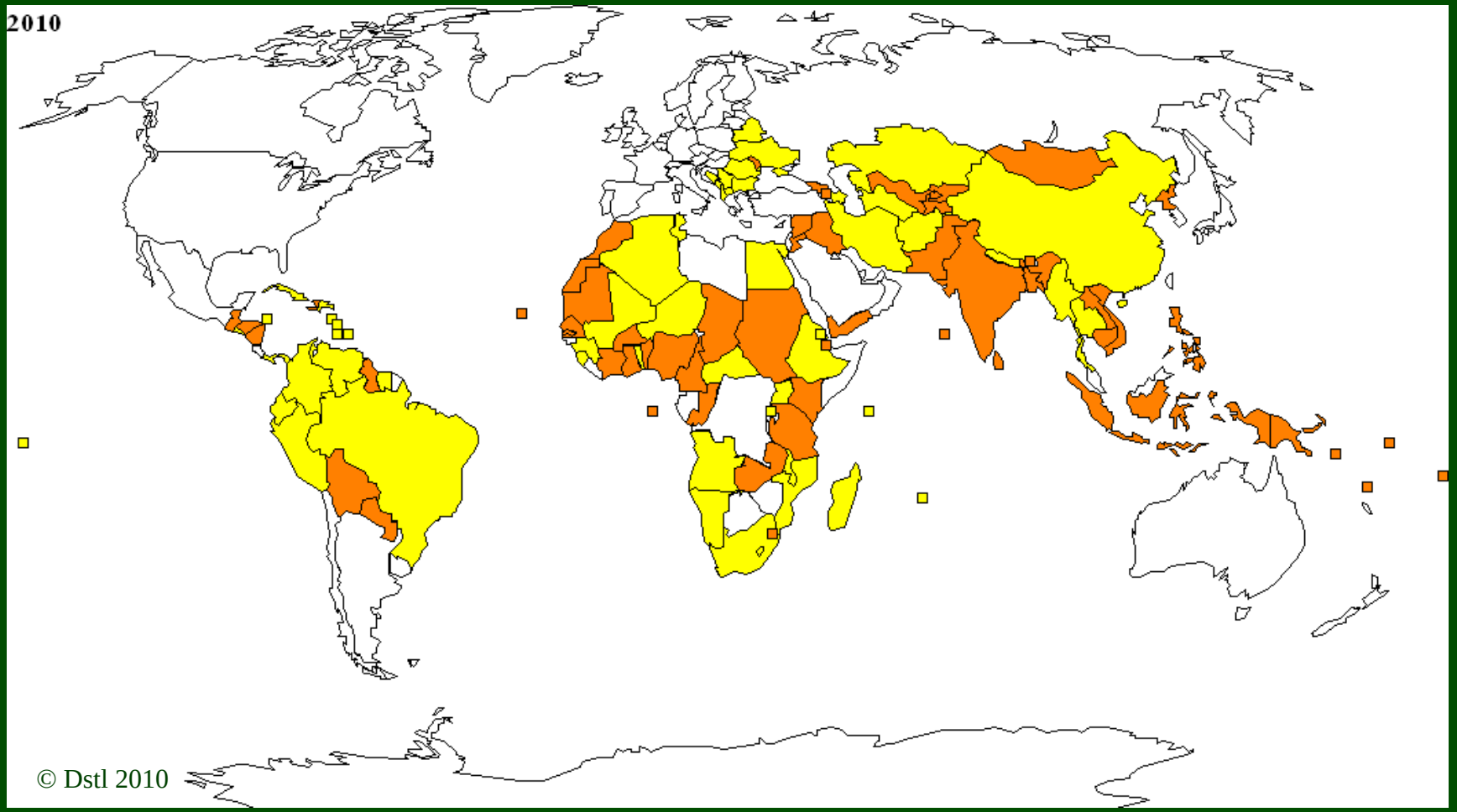
Predictions

- “Prediction is always very difficult – especially about the future”
- Clearly the most dangerous activity in any attempt to characterise future conflicts is any attempt to make predictions – as we have seen, randomness tends to dominate
- Nonetheless there were a few areas where we were able to make some predictions – though these were more on a statistical and actuarial basis than being attempts at prophecy

Prediction 1 – Conflict Locations

- One odd result of the original analysis was that the social axis (measured in real GDP/capita) showed no trend over time – the dog that didn't bark
- This is despite real world GDP per capita having risen by a factor of 3 over the same period.
- This indicates that something fundamental may be making societies at certain levels of development at greater risk of conflict requiring intervention
- This was used in the 2nd year of the study to estimate future conflict locations, drawing upon estimates of future GDP per capita calculated from the IMF World Economic Outlook

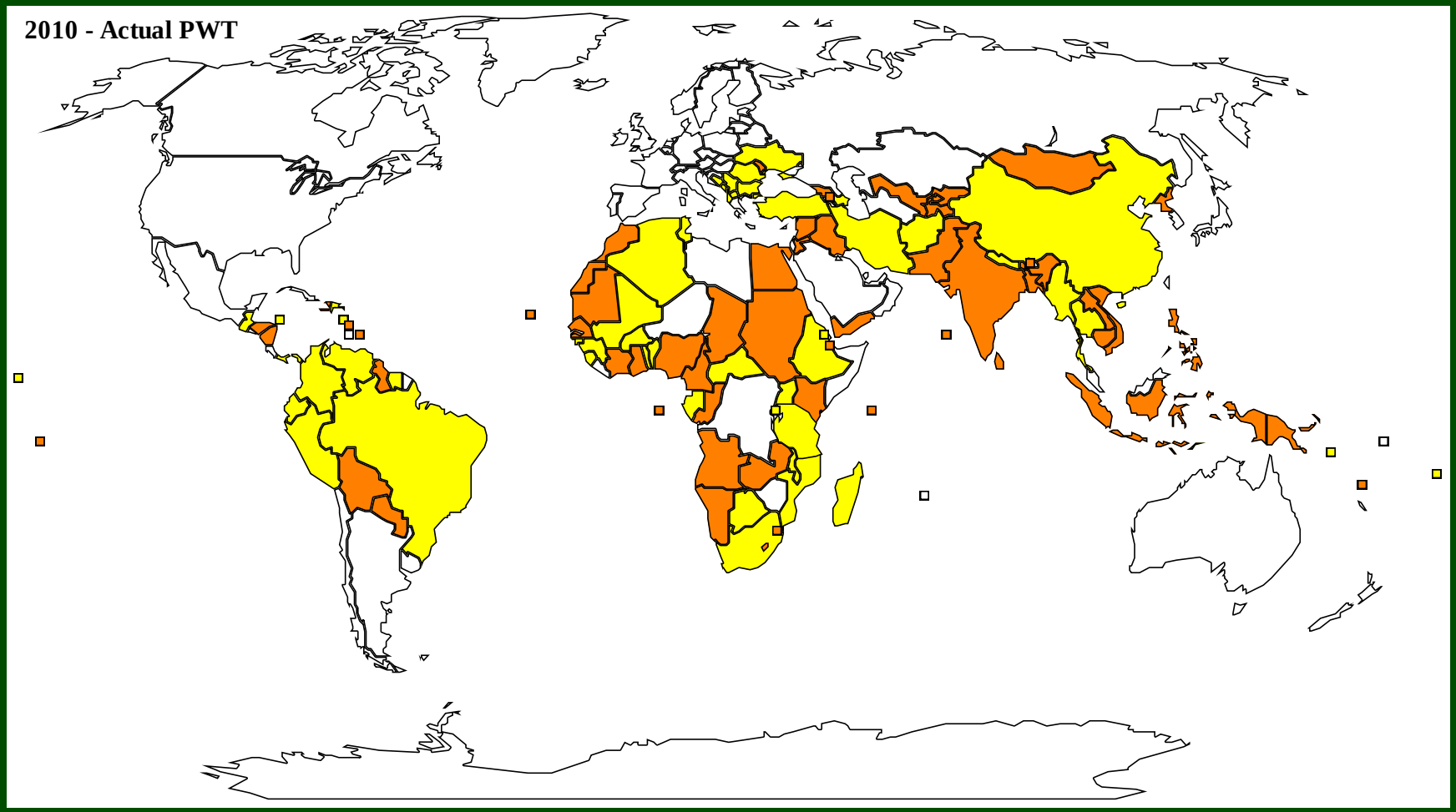
Conflict Locations 2010



Results

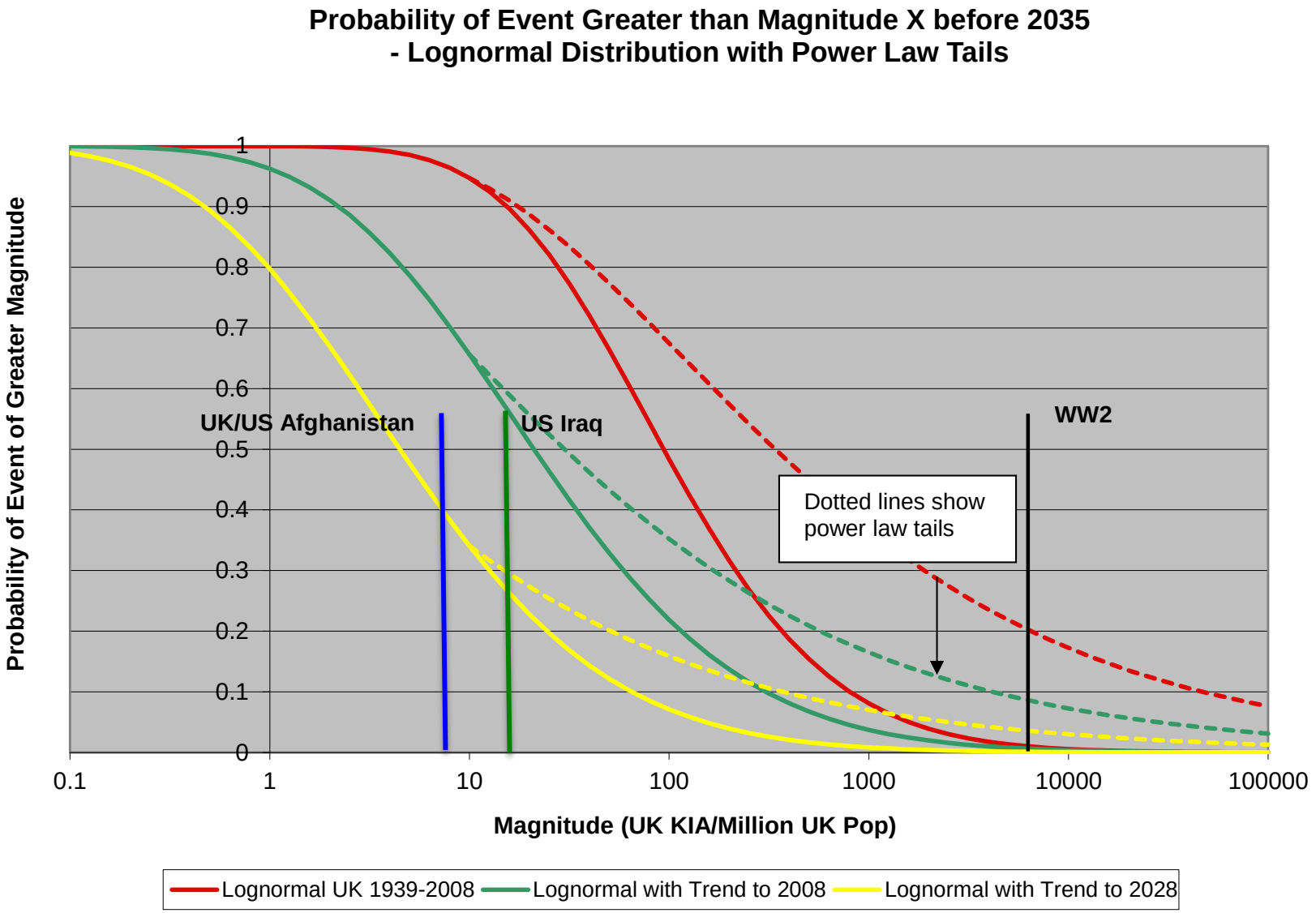
- As indicators of areas of unrest the model did quite well – the nations most affected by the Arab Spring are mostly highlighted in yellow or amber, and those least affected are mostly white
- As a precise indicator of conflict locations it did not do so well, Libya is shown as white, though Mali is highlighted in yellow and Gaza in orange
- Is this because the financial crisis has changed GDP per capita levels?
- The original estimates were from the 2009 WEO – we now have PWT data for 2010

Updated Conflict Locations



Prediction 2 – Conflict Intensity

- One of the most nerve-wracking results of the original study was our estimate of the likelihood of a severe conflict – as measured on our resource dimension – over the next 30 years or so.
- A graph was included in the original report showing the probability of conflicts of a given magnitude before 2035
- At the time it predicted a conflict of greater intensity than the then most challenging planning scenario with a probability of 40-75% over the period. This seemed a little high at the time and caused some nervousness.
- Unfortunately, the UK's losses in Afghanistan exceeded this level in mid-2011, so if anything this was an underestimate


Probability of Event Greater than Magnitude X before 2035
- Lognormal Distribution with Power Law Tails
Probability of Event of Greater Magnitude
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
UK/US Afghanistan
US Iraq
WW2
Dotted lines show power law tails
0.1
1
10
100
1000
10000
100000
Magnitude (UK KIA/Million UK Pop)
Lognormal UK 1939-2008
Lognormal with Trend to 2008
Lognormal with Trend to 2028

Conclusions

- The themes of the report have held up well, nothing has really challenged the idea that chance rather than policy determines involvement in conflict
- The trends shown in the report also seem to be holding up, with new data falling along the trend line for the Resource dimension
- The predictions have, as could be expected, had the most mixed results – the conflict in Libya was not on our list of potential conflict locations, though Mali was. The most nerve-wracking prediction, on the likelihood of a high casualty conflict before 2035 has already, most unhappily, been borne out.

Acknowledgements

- This paper would not be possible without drawing upon the work done by the author as part of the Dstl study team, which also included Prof Jim Moffat, Dr Stuart Taylor and Dr Tom Scales
- Any errors and responsibility for the views expressed remain the responsibility of the author.