But clouds got in my way: Bias and bias correction of VIIRS nighttime lights data in the presence of clouds

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This is an interesting paper.

The idea that Nightlights can measure overall activity level (and hence economic activity level) has been around but the devil is in the details.

The importance of this, in my view, is that it could give almost instant feedback on economic activity, well before any survey can be completed to get this information.

Of course this requires one to develop the relationship between nighttime lights and economic activity which in turn needs one to identify auxiliary variables that may be involved in the relationship and develop way of estimating the variables (if not directly available).

I will mention some naive thoughts on this .. some of them may have been answered or have been thought of by the authors, but I am mentioning them so initiate a discussion.

My view - as a statistician - is that the nighttime activity along with few other variables... can give a reasonable estimate of economic activity.

Cloud / Rain:

The most obvious such variable has been addressed by the authors.. impact of cloud / rain on the nighttime measurement by a satellite!

Country:

The relationship will depend upon overall activity in a country - in my view. At least this should be explored.

Urban??

Another obvious variable is the percentage of area covered by urban area in an HR *homogeneous region*. Thus Bombay region will have different characteristics as compared to the Jhabua-Nimar HR mentioned by the authors.

The main effect, in my view, is the relationship between nighttime lights and economic activity in the last few years - for this one could take into account the months outside the monsoon months, as a first step.

Then we can compare this with the connection one estimates by using all 12 month data after correcting for the bias!

If the difference is small, one could conclude that bias has been corrected well.

One could also estimate effect of a country as a whole, if we are comparing multiple country data.

Most of us in India are aware of the South-West monsoon (June-August). I heard about North-East monsoon only after I moved to Chennai about 11 years ago. The north-east monsoon has an impact, on Chennai region, and the time frame is October-December.

Though the impact of South-West monsoon is far more than the impact of North-East monsoon and the region of influence are distinct, this can be used in building model for relationship between nighttime lights and economic activity.

Zone/State ??

If we are looking at India, it may be interesting to explore if the division of India in 4-5 zones (north, south, east, west central) can we see any persistent difference and if so, we can use this.

The same can also be tried with state as a variable instead of zone. Perhaps small states can be clubbed with neighbouring states.

Thus in my view, this is a great beginning, and perhaps over time we can estimate the other factors and improve the estimation of economic activity.