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Calibration of the SABR Model in Illiquid Markets

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Abstract

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Key

Acknow

Thanks t ur Phillips of RiskWorx, and Patrick Hagan of Bloomberg's.

Notes

1. Some care needs to be taken with machine precision issues here. One can have that z≈0 and χ(z) = 0 to double precision. This needs to be trapped, and the limit result invoked, again putting .

2. Although significantly, not all. Real Africa Durolink, a smaller bank, but major player in the equity derivatives market, failed within days of the introduction of the skew, as they were completely unprepared for the dramatic impact the new methodology would have on their margin requirements. See West (2005, Section 13.4).

3. The only difference here is that we do not make the assumption of zero means, which we do when using returns to calculate volatilities. The implementation is elementary.

4. When there are three real roots, they are of the order of −1000, 1 and +1000. So we take the root of order 1.

5. Of course, some experimentation with the choice of the weight determined by the quantum is necessary. One could choose Q^2 for example, or indeed any positive weight. There will be no requirement for any smoothness of the weight in what follows.

6. Note t .

7. Of cou n that they are unch -Mead algorithr

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