

Measuring and Forecasting Financial Stability

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Thomas King

Board of Governors of the Federal Reserve, Washington

Comments on „Estimating the Market Value of the Implicit Guarantee to Fannie Mae and Freddie Mac Using Contingent Claims“

Discussion of Michael Gapen's

**“Estimating the Implicit
Government Guarantee to
Fannie Mae and Freddie Mac”**

Tom King

Federal Reserve Board

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Background

- Idea of Merton framework is that equity can be modeled as a call option on the firm's assets.
- Use to evaluate default probabilities has garnered increased interest lately:
 - Hull et al. *Journal of Credit Risk*, 2004
 - Carr and Wu, working paper, 2006
 - Capuano, IMF paper 2008
 - Carlson et al., FEDS paper, 2008

Current Paper

- Innovations of Gapen's paper:
 - Explicit focus on Fannie and Freddie
 - Careful about liability structure and “trigger points”
 - Evaluating V_A and σ_A also allows us to price a *put* option on the firm's assets
 - This put option can be interpreted as the implicit government guarantee.

Current Paper

- In the days leading up to conservatorship, the point estimate of the guarantee was about \$40 bil for Freddie and \$95 bil for Fannie.
- This is about the order of magnitude of the Treasury's capital repurchase plan
- However, in VaR simulations, upper confidence bounds are much larger

Comments/Suggestions

- Normality?
- Trigger points?
- Timing of the option “maturity”?

These issues may be particularly important here, because we are looking for an exact dollar value.

Comments/Suggetions

- Guarantee assumed equal to expected losses on senior debt.
- But markets may not have perceived it this way.
- Indeed, CDS spreads indicate that senior debt had some risk.
- Perhaps combining CDS and equity information could yield market perceptions of the guarantee.

Possible Extensions

- Would be interesting to apply framework to other large financial institutions.
 - Especially now that there appears to be some sort of guarantee even for non-banks. (AIG, Citi)
 - Also would be interesting to look at moral hazard effects:
 - Do managers maximize the put-option value?
 - Do changes in the market-perceived guarantee affect risk taking?

An alternative approach?

- In particular, (ignoring discounting) the value of a put option on equity with strike price s is:

$$P_s \approx \int_0^{L+s} V_A f(V_A) dV_A$$

where $f(\cdot)$ is the distribution of V_A .

- If we have a few of these option prices, we can estimate or interpolate the lower tail of $f(\cdot)$ (given a functional form).

An alternative approach?

- Taking this idea further, the value of a CDS contract on \$1 of L is

$$CDS = 1 - \frac{1}{L} \int_0^L V_A f(V_A) dV_A$$

- This gives us information about points on $f(\cdot)$ below observable option values.
- This can improve the interpolation.

An alternative approach?

- Advantages of this approach:
 - Focuses on lower tail
 - Gets away from normality
 - Could estimate trigger points
 - Using options and CDS of different maturities, can get a term structure of default risk
 - Can estimate expected recovery rates, which may give more information about the perceived guarantee