Discussion of

The End of Market Discipline: Investor Expectations of Implicit State Guarantees

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TBTF-related moral hazard and banker psychology

- Version 1, full awareness: "I know that the government will bail us out if we crash, so let me take on more risk and earn the upside"
- Version 2, self-deception: "Hey, our investments earn us a spread relative to what we pay for funding in the markets. That's because we're so smart at finding arbitrage opportunities/we are providing such valuable intermediation services/we are such a well-run business... Let's do more of it."
- Version 2 seems more plausible—and this paper gets to precisely this version of the TBTF problem: Lack of market discipline from funding markets.

Quantifying the subsidy

- Merton model: Equity and risky debt as options on the assets
- Distance to default (DD) = How many s.d. does asset value exceed face value of debt
- Identification of TBTF subsidy (simplified): Credit spread regression

$$y = \beta DD + \gamma TBTF + e \tag{1}$$

- Assumption: DD correctly reflects default risk of TBTF banks that would prevail in *counterfactual* world without implicit guarantees
- Results: TBTF subsidy $\approx$ \$20bn annual pre-crisis. One might view this as quite small.

Comments

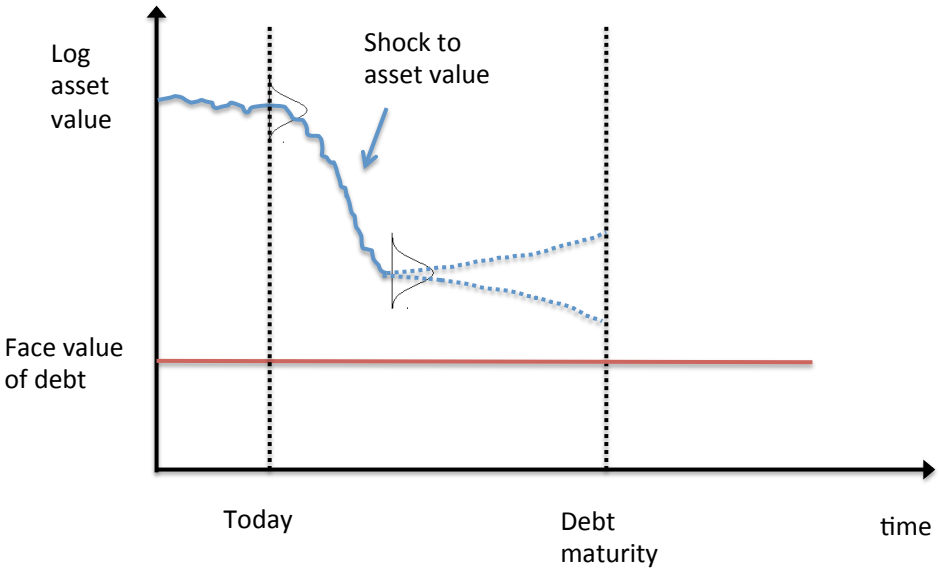
Four reasons why application of Merton model in this paper might understate TBTF subsidy:

1. Embedded optionality in bank assets
2. Government guarantee is an asset that raises distance to default
3. Use of historical data in calibrating Merton model
4. Do implicit guarantees only affect credit spreads of TBTF banks?

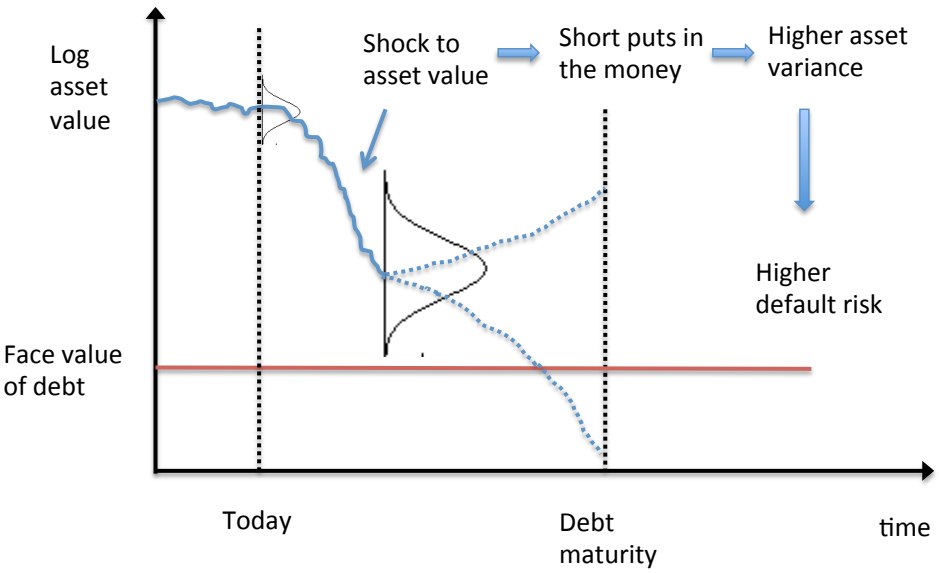
Embedded optionality in bank assets

- Assumption in Merton model: Asset value with constant variance, log-normally distributed at debt maturity
- However: Bank assets include portfolios of embedded options. Examples:
  - loan portfolio = portfolio of default-free debt combined with short put options
  - super-senior tranches = default-free debt combined with far-OTM short put options
- Consequence:
  - variance rises as asset value falls
  - distribution of asset value at debt maturity not log-normal
  - standard deviation of log value is not all that informative about probability of default
  - Merton model underestimates default risk

Merton model assumption: Constant variance



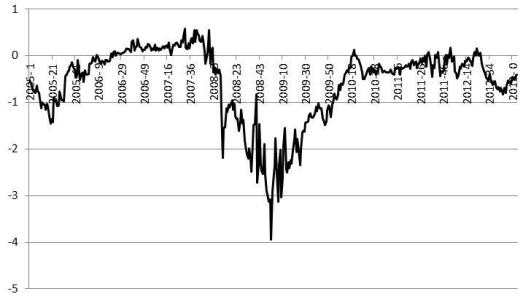
Short put options embedded in bank assets: Asset variance increases after negative asset value shock



Embedded optionality in bank assets: Where does it matter most?

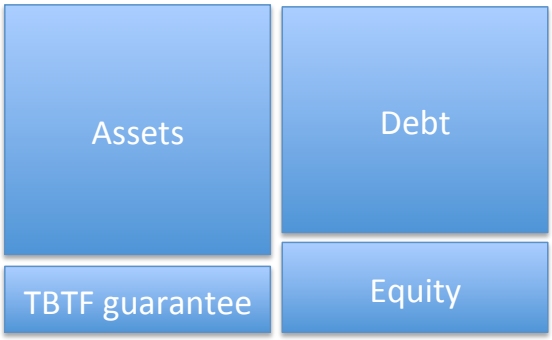
Where is substantial underestimation of default risk most likely?

- big banks with big derivatives positions
- in "good times" when options embedded in bank assets are far OTM
- comparison with corporates (which do not have short-put-option-like assets to the same extent)



Government guarantee is an asset that raises DD

- Paper, fn. 7: *"... the implicit guarantee... does not prevent a financial institution from ... having its equity wiped out... Distance to default captures these losses and, therefore, does not reflect the implicit guarantee itself."*
- But, government guarantee is an asset that raises the distance to default prior to debt maturity



Government guarantee is an asset that raises DD

- Example: Debt with $F = 100$. Asset value $A = 100$ (w/o guarantee). Let $r_f = 0$ and $t < T$.
- w/o guarantee: $A = F$, and hence $DD = 0$
  - debt risky with market value $D = 90$
  - equity with market value $E = 10$

  Backing out A and DD from observed E and F yields $A = 100$ and $DD = 0$.
- with guarantee with $PV = 10$: $A = 100 + 10 = 110 > F$
  - $D = 100$
  - $E = 10$

  Backing out DD from observed E and F yields $A = 110$ and $DD > 0$.

$\Rightarrow$ measured DD $>$ counterfactual DD w/o guarantee

$\Rightarrow$ TBTF subsidy underestimated

Calibrating the Merton model

- Merton model calibrated with equity standard deviation measured over past 12 months
- Suppose recently volatility was very low and stock price high. Following logic of Merton model...
  - asset volatility very low
  - asset value must be very high for stock price to be high
  - asset value many s.d. away from default threshold
  - this justifies the low observed credit spread
  - regression estimate of TBTF subsidy very small
- However, recent volatility is a bad forecaster of crises. What may really be going on is...
  - tail risk still high despite low recent volatility
  - credit spread would be high in absence of implicit guarantee
  - TBTF subsidy big
- It would be useful to feed the Merton model with data that includes some crisis periods.

Do implicit guarantees affect credit spreads only of TBTF banks?

- Identification of subsidy in this paper assumes that banks that are not among the biggest don't benefit from subsidy
- But perhaps smaller banks also benefit
  - TBTF institutions may be able to sell underpriced tail-event insurance to other financial institutions?
  - Linked to TBTF counterparties in derivatives and wholesale funding markets?
  - Smaller banks "too correlated to fail" rather than TBTF in crises?
- If so, the relative comparison of credit spreads of smaller banks with those of TBTF banks does not capture full amount of implicit subsidies

Summary

- Paper tackles an important and difficult task
- Evidence quite convincing that TBTF subsidy exists
- Estimates of the subsidy's magnitude are likely biased downward
- Extending the Merton model to better account for bank asset risk dynamics would help to improve the estimates