

Discussion

“Stress Testing Credit Risk: The Great Depression Scenario” by Simone Varotto

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Note: The opinions expressed in this presentation are only the presenter's own and do not reflect the opinion of the ECB or the Eurosystem.

Outline

- 1. Idea**
- 2. Results**
- 3. Comments**
- 4. Conclusions**

- **Test how much capital banks should hold against their corporate loan portfolios (IRB) to withstand historical stress scenarios**
- **Focus on the Great Depression as a stress scenario using Moody's corporate default and rating transition data from 1921 to 2009**
- **Loss valuation model based on Carey (2002) with an extension to include migration risk, portfolios with different credit qualities, a derivation of counter-cyclical capital buffers and a comparison of credit risk capital with the Basel 2/3 regulatory minima**
- **Different approach compared to standard satellite equation models linking macro factors to micro risk parameters (implicitly taken into account) or logit/probit regression frameworks**
- **Assumption: Using historical default rates allows taking account of correlation and feedback effects**

Results (I)

- Expanding the holding period for exposures in the corporate portfolio from one year, as currently assumed under Basel 2/3, to three years, increases capital needs by more than three times
- Inclusion of migration risk (time varying rating transition matrices) causes smaller but still sizeable increases in capital requirements
- Basel 2 total capital and Basel 3 capital buffers (not Basel III total capital) are enough to absorb Great Depression style losses over the first year of the crisis but not for banks with low quality portfolios or over longer holding periods
- Great depression implied capital buffers for different holding periods

	Portfolio Credit Quality			
	High	Average	Low	Very Low
1	3.5	4.5	5.2	5.2
2	6.8	7.8	8.6	8.7
3	7.5	8.7	9.7	9.9

Results (2) – channels

- **Recovery rate (constant vs. time-varying)**
- **Rating transition matrices and default rates (1921-1960 due to data quality issues in the Caa rating category)**
- **Probability of default (risk neutral vs. real)**
- **Interest rate (nil, 3%, 6%)**
- **Similar to Elton et al. (2001) the value $V(t)$ of a corporate exposure at given time t is computed with the following iterative equation:**

$$V_t = \frac{aP_{\tau,t+1} + (C + V_{t+1})(1 - P_{\tau,t+1})}{1 + f_{t,1}} \quad \text{for } t = \tau, \tau + 1, \dots, \tau + n - 1 \quad (1)$$

Comments (I)

- **Robustness tests on recovery rates are useful**
- **The quantile matching method applied for the construction of historical recovery rates from 1921-1989 could be back-tested with stochastic recovery rates based on a beta distribution using Moodys recovery rates from 1990 until 2009**
- **What about collateral and its impact on LGDs?**
- **Moody's historical default data are dominated by US companies (85%)**
- **To draw a conclusion on other Basel member countries is not straightforward**

Comments (2)

- **Are the portfolio compositions based on the study by Gordy (2000) still valid?**
- **Since the default rates provided by Moody's are a key driver of the results, it would be useful to have a set of descriptive statistics that goes beyond the summary of Table I**
- **It would be interesting for the reader to show the number of issuers not only for the Caa-C rating category over time but also for the other rating buckets**
- **Useful to analyse the change in credit rating standards over time, i.e. are the rating buckets strongly fluctuating over time or consistent**

Comments (3)

- **Stress tests based on historical events are a useful tool**
- **However, the future might be different compared to what has happened in the past**
- **Financial markets today are different from those prevailing during the **Great Depression** and more integrated**
 - **Thus, correlation and feedback effects implicitly captured by the **Great Depression** scenario might be different today and even more pronounced due to higher financial integration**
- **A stress test should ideally capture several data sources and loss transmission mechanisms**

Conclusions

- **Overall a mature paper with a useful evaluation of Basel 2/3 capital requirements**
- **Interesting findings for corporate portfolios**
 - **However, not clear whether we can draw conclusions from the losses in the corporate portfolio on the calibration of Basel 2/3 capital buffers for the entire loan portfolio**
- **Recovery rate assumptions, including the role of collateral, seem to be a weak link in the analysis due to lack of appropriate data**
- **Data quality issues regarding historical default recordings (i.e. data gaps, small sample bias) should not be underestimated**