

Internet Appendix A95: Bank Risk

A95.1 Illustrative Pitch Template Example

Pitcher's Name	Xiping Li	FoR category	Banking	Date Completed	3 June 2016
(A) Working Title	Measuring bank risk by z-score				
(B) Basic Research Question	How to measure New Zealand / global bank risks using z-score, and what are following consequences?				
(C) Key paper(s)	<p>Hannan, T. H. & Hanweck, G. A. (1988). Bank insolvency risk and the market for large certificates of deposit. <i>Journal of Money, Credit and Banking</i>, 20(2), 203-211.</p> <p>Lepetit, L. & Strobel, F. (2013). Bank insolvency risk and z-score measures. <i>Journal of International Financial Markets, Institutions and Money</i>, 25, 73-87.</p> <p>Zedda, S., & Cannas, G. (2015). Assessing banks' systemic risk contributions: A leave-one-out approach. <i>Available at SSRN 5687920</i>.</p>				
(D) Motivation/Puzzle	<p>Z-score or Risk Index has been supported to be a good measure of bank risk taking. It represents a bank's distance from insolvency. Higher value of z-score indicates a low probability of insolvency, thus greater banking stability. However, despite of its popularity in measuring bank risk, there is a lack of consensus on a standard way to construct time-varying z-score measures. We intend to find a more superior way to compute time-varying z-score. On the other hand, there is increasing attention on bank risk measure at systemic level. Existing systemic risk measures are generally based on share market data or regulatory data. There are few studies on systemic risk analysis of unlisted banks, which can only rely on accounting data, but may not be publicly available.</p>				
THREE					
(E) Idea?	<p>Z-score is calculated as the return on assets plus the equity to asset ratio divided by the standard deviation of asset returns. In this sense, it represents how much variability in returns can be absorbed by capital without the bank becoming insolvent.</p> <p>In our essay, we first take New Zealand as the example, and empirically compare several widely-used approaches to construct z-score for New Zealand banking market. Different ways to calculate ROA and standard deviation of ROA, which are components of z-score, are analysed and compared. We also include similar analyses for major Australian banks as a comparison. May further include top banks in other countries with concentrated banking system.</p> <p>Secondly, we propose aggregate z-score and marginal z-score, which use publicly available accounting data to measure overall risk of the system and contribution of individual banks to system risk. We intend to fill the gap of systemic risk measurement of unlisted banks.</p> <p>Thirdly, we extend a risk-adjusted z-score, by using Tier 1 capital and Risk Weighted Assets. We intend to compare the risk-adjusted z-score with traditional z-score in measuring individual bank risk and systemic risk.</p> <p>Finally, only a few prior studies mention the decomposition impact of z-score, in which additive components are directly used in regressions. We intend to investigate how each component contributes to z-score.</p>				
(F) Data?	<p>(1) Data. New Zealand banks are required to publish quarterly disclosure reports from the beginning of 1996. We develop our analyses mainly based on quarterly data, together with comparison using annual data. Annual data of major Australian banks are collected in banks' annual report, and are available from 1996. All annual and quarterly data have already been spread-sheeted. Annual data for top banks in other countries are available from the Banker Database.</p> <p>(2) Cross-sectional sample size is limited to major banks only, but we have access to extensive longitudinal data.</p> <p>(3) Some data may be analysed as a panel.</p> <p>(4) Tier 1 capital and risk weighted assets data are manually collected from banks' quarterly disclosure reports.</p> <p>(5) More data sets have become available or data have become more comprehensive in recent years, which mean that some analyses may only cover recent periods.</p>				

	<p>(6) Preliminary analysis suggests no great problem with data.</p> <p>(7) Data should be reasonably sound, but there have been changes in accounting standards, particularly with adoption of IFRS. There may also be some problems during the transition periods of Basel Accords.</p>
(G) Tools?	<p>We measure z-score (both traditional z-score and risk-adjusted z-score) using different approaches, regarding to different ways to calculate ROA and standard deviation of ROA. Preliminary results support the approach which uses rolling mean and standard deviation of ROA over previous 16 quarters, together with current period value of equity-to-asset ratio.</p> <p>Aggregate z-score is computed using banks' consolidated accounting data, and marginal z-score is computed by dropping one bank at a time from the portfolio. Marginal z-scores represent incremental risk of individual banks to overall systemic risk. Preliminary results suggest that the four largest banks (ANZ NZ, ASB, BNZ, and Westpac NZ) have greater contributions to systemic risk.</p> <p>Further studies should be done to examine decomposition impact of z-scores, using correlation analysis and/or regressions.</p>
TWO	
(H) What's New?	<p>Although there are several existing studies using z-score as a measure of bank risk taking, our paper is the first one to explore risk-adjusted z-score. Comparisons of risk-adjusted z-score with traditional z-score may suggest the sufficiency of tier 1 capital ratio in banks' regulations. It is also the first paper to propose marginal z-score, which is applicable to systemic risk measure of unlisted banks. This paper also enriches analyses on decomposition impacts of z-score.</p>
(I) So What?	<p>Our answers may support decision-making on bank regulation and risk management. The GFC has highlighted the significance of banking regulations, and the adoption of Basel III also provides frameworks to deal with bank risk management. It may also provide a stronger perspective on the resolution of z-score as a risk measure.</p>
ONE	
(J) Contribution?	<p>This is part of the contributions of my PhD thesis, and we will be looking for publication in quality journal.</p>
(K) Other Considerations	<p>This will be a collaborative project – at this stage only involving people at Massey University. Target journals are not yet defined.</p>