Credit analysis (principles and techniques)

INTRODUCTION

Credit analysis focuses at determining credit risk for various financial and non-financial instruments as well as projects. Credit risk analysis can be separated into two steps. The first part consists of analysing the credit risk of a particular asset. Given the information in the first step, the second part analyses the risk of the whole portfolio which comprises the individual credit sensitive entities. And it is true that the measurement and management of credit risk has become a key risk-management issue for both financial and non-financial institutions. With the improved liquidity in credit derivative market and advances in modelling, the accurate measurement and management of credit risk to achieve the desired exposure is not as difficult as before.

IMNPORTANCE OF CREDIT ANALYSIS

In the past decade, regulators have been gaining familiarity and experiences in the monitoring of banks and other financial institution in terms of solvency and capital adequacy. Some of the perverse effects of the Basle accord have been widely documented. With the arrival of the new Basle II accord around 2005 and other improvement in accounting, it is important for financial institutions to develop internal models to demonstrate the capability of risk management, including demonstrating the effectiveness of hedging which can result in freeing up of regulatory capital. Given the improvement in the

regulatory regime, sound credit analysis, rather optimization according to arcane rules, are more relevant for the future. During 2001 and 2002, there have been very high profile cases of default, such as Enron and WorldCom with very large amount of outstanding debt. Some financial institutions have been caught unguarded with large amount of exposure. During the late 90's, banks have been pressured to lend money to gain business in other areas such as merger and acquisitions, resulting in large exposure of idiosyncratic credit risk to particular companies. The current prevalent practice of marking loans at par value regardless of the counter party's credit risk poses significant problems in proper risk management. Therefore the correct credit analysis and accurate measurement of the amount of credit risk involved is very important in determining whether the extra benefit from other business can compensate. With the increasing usage of largely unfunded derivative transactions, such as swaps, it is increasing important to assess the counter party risk, as well as the correlation between market risk and credit risk, as the collapse of the trading company Enron readily demonstrated.

CREDIT ANALYSIS OF A PARTICULAR ASSET

The analysis of a particular asset is a relatively familiar notion. Rating agencies such as Fitch, Moody's and S&P provides credit rating on individual companies as well as particular issues of bonds of the companies. With the improvement of liquidity of credit derivatives such as credit default swaps, more timely information on the market assessment of the credit worthiness of particular companies is available. For companies of which the credit derivative market or cash bond market is active, the evaluation for the credit risk of a reference entity is relatively simple. If liquid market instruments are

not available, a detail structural analysis of the company's balance sheet as well as other accounting and market information, such as its equity prices (such as the case in the structural model by Robert Merton and KMV), is required to determine the credit worthiness of the entity.

PORTFOLIO CREDIT ANALYSIS

Having all the individual credit analysis information is only the first step for analysing a portfolio of credits. Defaults and credit events tend to happen in clusters around time as well as in industrial sector. The high number of defaults and credit downgrades of telecommunication companies from 2001 to 2002 is a testimony to this stylised observation. A number of models have been proposed to model the correlation:

i. Credit Metrics, developed by RiskMetrics
ii. CreditRisk+ by Credit Suisse Financial Products
iii. Credit Portfolio View by McKinsey and Company

All these models take the credit analysis of the individual companies as inputs. These models impose some structure of dependency in defaults across companies. A popular approach is to use copula that essentially is a mathematical function that generates a joint distribution from individual default distributions. A second approach is to assume companies depend on common factors as well as idiosyncratic factors that are specific to the particular company. However, since default is a rare event, data for correlated defaults are even more difficult to observe. This can be a difficult hurdle when using these models. However, with improvement of liquidity in multi-asset credit derivatives such as basket default swaps, the correlation

and other dependency information among credits can hopefully be inferred from the market, and effective hedged using these instruments.

MEASURING THE EXPOSURE

If the amount owed by a counter party is a fixed sum, the exposure is easy to define. However, in a lot of circumstances, the counter party exposure varies according to market conditions. This is especially the case for derivative transactions such as swaps. The counter party is more likely to default when market condition moves adversely. To take into account the correlation of credit exposure and market movement, we need to model the market risk as well as credit risk jointly. This is in sharp contrast to the traditional approach and remains a challenge to risk management in volatile markets. To model this, in general we need sophisticated models across different asset markets so that the exposure can be obtained by simulation under different scenarios. The good news is that there is an active market for credit risk as well as market risk, so that the individual components can be hedged effectively. However, the joint movement risk remains difficult, if not impossible to lay off, and awaits future innovation in the derivative industry.

Entry category: credit risk management

Scope: financial statement analysis, ratio analysis, models for ratio analysis, e.g. credit scoring, default prediction (Altman model, etc),

Related articles: market credit risk models, credit derivatives.

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The views and opinions expressed herein are the ones of the authors' and do not necessarily reflect those of Goldman Sachs or Morgan Stanley.