Keith Allman
Principal

Challenges of Structured Finance Data Analysis in Emerging Markets

Structured finance transactions in nascent markets have a variety of challenging aspects, but the most fundamental difficulty for deal analytics is finding data and applying it appropriately. Asset-backed transactions in emerging markets often suffer from a scarcity of data, disorderly records when they exist, and occasionally imprecise methodologies to analyze and employ such information. The transactions that have been executed thus far have attempted an array of market standard methodologies to tackle these problems, a number of them successful, however many come up short due to calculation misunderstandings and the inapplicability of conventional analyses to unique emerging market products and cultures. Organizing the data that exists, correctly applying standard techniques, and exploring alternative methodologies are critical to increasing deal flow and accurately assessing risk in the emerging markets.

Much of the deal flow in any new market will naturally have a lack of data. This is particularly endemic to structured transactions because to correctly assess the collateral risk extensive sets of historical data is preferred. An excellent example is the Mexican residential mortgage backed securities (RMBS) market, which began with Hipotecaria Su Casita's S.A. de C.V. (Su Casita) and GMAC Hipotecaria's S.A. de C.V. (GMAC Hipotecaria) US$53mm securitization in 2003. Since then many Mexican private housing institutions, otherwise known as Sofoles, have been looking to do similar deals, but get delayed when they try to produce historical loss, prepayment, and recovery data. Given that many of the mortgages have 25 year tenors and the market has just begun developing over the last few years, most of the Sofoles can only produce limited sets of historical data. Even though some have initiated the process of transferring paper documents into digital databases, the average Mexican RMBS relies on 7 to 8 years of credible data.

With a small amount of data vis-à-vis the asset tenor, extrapolation is necessary to produce proper loss curves that correctly capture the severity and timing of loss. Typically, to project loss curves for newer vintages, a base curve is created using older loans that have reached the end of their term. The timing from the base curve is then used to project out the loss rates for the newer vintages. Since this isn't a possibility if only 8 years of data exists on a 25 year asset, some other type of loss estimation needs to take place. Rating agencies have come forward and pushed for meltdown scenarios where loss is projected to be similar to rates experienced immediately after the 1994 Tequila Crisis: 35% gross default rates over an 18 month period.

Using such a default rate could be completely unrealistic given the behavior of many mortgage products. In the U.S. the Public Securities Association (PSA) produced the standard default assumption (SDA), based on decades of mortgage data. While the severity of loss in a mortgage deal is volatile, based on ability and propensity of obligors to pay, the timing of loss is relatively stable and typically looks like the curve in Figure 1.

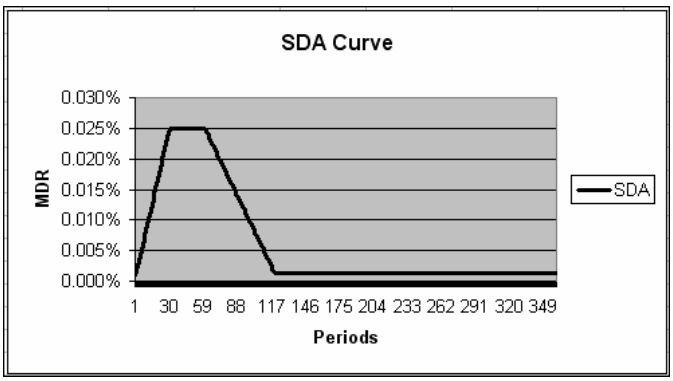

Figure 1

A quick look at the curve suggests a steep increase in defaults up to period 30, a peak incidence of default for 30 periods, and then a drop off of defaults that eventually stabilizes to a minimal rate after period 120. Defaults tend to take place early because most obligors who default have incorrectly calculated the mortgage amount they can afford, inaccurately anticipated the payment shock of a hybrid product, or are in a deteriorating home value environment with a high mortgage balance (as seen in loan to value (LTV) calculations). As time goes on obligors typically figure out their budget or increase their equity value to such an extent that default is a very unattractive option.

Regressions of Mexican fixed rate mortgages against the SDA curve show similarities in timing, which suggest a similarity of payment behavior. This means that it is reasonable to project fixed rate Mexican mortgage loss curves using the SDA timing curve as a basis. This loss curve could then be stressed by rating agency standards to achieve a rating. The rationale to use similar behavior patterns for similar products, as a basis for extrapolation, is much more reasonable than arbitrarily using a historically stressful default and timing rate.

However, the U.S.SDA curve should not be seen as a panacea for extrapolation difficulties. In many emerging markets certain assets are paid for through obligor pay check deductions. This subtle difference actually has a profound impact on default behavior. As mentioned earlier, standard credit risk assumes that an obligor defaults because of propensity and ability to pay. In regards to propensity, studies show that even if a person has the ability to pay, some do not. Very wealthy people occasionally have poor credit scores because they do not manage their money well. The other component is whether an obligor earns enough money to pay his or her bills. If there is not enough money then bills are prioritized and some go unpaid.

When payments are deducted straight from an obligor's paycheck, default risk due to propensity and ability to pay changes. Many of the corporations or state entities that utilize an automatic deduction feature enforce payment as long as the obligor maintains a formal sector job and sizes the payment based on salary and current debt load. This creates a situation with much less credit risk than a traditional loan. However, this should not suggest automatic deductions are perfect systems. When obligors with automatic deductions lose their jobs, cash flow to the assets often stops immediately. If the obligor finds another job then the payments will start up again. If the obligor remains unemployed or finds employment in the informal sector then payment will not resume. Employment as the

primary determinant of delinquency and default removes a large behavioral aspect seen in traditional loss analysis.

In order to measure employment risk correctly studies need to be done on formal sector employment rates, transitions to unemployment, further migration to the informal sector, and return rates to other states. A transition matrix could be created from historical data to accurately project employment expectations. Also, granular analysis can be done on certain types of employment, since some jobs are more stable than others. In particular, state and federal workers in emerging markets enjoy much more job stability than private sector employees. In certain situations governments assist with instability, as in Mexico with the Infonavit mortgage payment deduction system, where a period of non-penalized delinquency is allowed until the obligor finds another job. These grace periods are part of many government related programs and also need to be taken into account when measuring payment risk based on employment.

Besides unique payment systems, the emerging markets must also contend with unique payment behaviors. As sophisticated financial products are introduced into new markets, customers must learn the risk and reward of the products. For instance, many countries that begin to introduce mortgages on a wide spread basis encounter very high prepayment rates. This is largely because many regions do not have a culture of debt and want to get rid of any financial liability. However, once customers begin realizing the tax benefits and other financial advantages of mortgage products, prepayment rates tend to decline.

For this reason, transactions need to be modeled with various prepayment curves. Front loaded and back loaded curves should be run depending on the specific country and asset class. Also, it is imperative to learn about even the most esoteric aspect of a country's financial system to determine which curve best represents the region. For example, certain emerging market countries provide government subsidies to citizens. To qualify for these subsidies people cannot make more than a certain amount per year. For citizens who receive cash, prepaying a mortgage is an excellent use since wealth can be built without having to show the money as income. In such cases, historical data needs to be analyzed so custom prepayment curves can be created

Another major data element for structured transactions is a recovery assumption for collateral that is defaulted. With tremendously different legal systems between countries, recovery rates and time to recovery varies widely. When performing a recovery analysis, it is important to constantly monitor the legal system of an emerging market country. Laws change rapidly, which can have significant impacts on collateral. In Argentina in late 2006, a large deal involving non-performing mortgages was approaching the bid date. On the morning of the bid a law was enacted that changed the judicial status of U.S. dollar denominated mortgages originated prior to a specific date. If any such collateral were in a pool they would have to be reanalyzed and the bid amount adjusted, all before the bid time when millions of dollars are potentially committed.

Regardless of the type of data: default, prepayment, or recovery, any data analysis in emerging markets must take into account historical obligor data, the asset class, and most importantly the country's cultural and behavioral norms. Customers of collateral that back

structured transactions in emerging markets are evolving constantly. Similarly new products are being introduced that are more complex and comparable to those of developed nations. Combining those factors with diverse cultural nuances requires comprehensive, and often times, unique analytical methods to properly assess risk and reward.

Enstruct

Enstruct provides clients with structured finance modeling instruction through accurate, transparent, and comprehensible curriculum. In all parts of the global capital markets, innovative deal structures have become commonplace and require custom modeling to fully understand the spectrum of risk and reward. Third-party software with "black box" technology is difficult to customize and puts your most important transactions in someone else's hands. The smart alternative is to develop internal resources with a high degree of financial and technical expertise. Enstruct can make it happen.