

Commercial Banks are caught with “ Out of the Money - Short Gamma” Strategic Positions

By Andre Horovitz

Any junior derivatives trader is being taught during her first intro session on the job to be very careful with "writing out of the money options", or in a finance parlance: "go negative gamma".

The reason is that unlike long positions in options, where the maximum a trader can lose is the value of the premium she paid, a "written" or "short" option exposes her to a potential unlimited (or in the case of puts very high) loss.

Yet, let's examine the core business of a regular commercial bank, that takes customer deposits, refinances itself in the interbank markets and/or via the central bank "window" and lends all the money via long term loans (collateralized or not) to customers.

A loan lent to a customer is essentially a leveraged position in a long term (the same term as the average life of the loan) risk free bond + a short put option (written to the customer) - as the customer has the right to default on the loan when her economic conditions deteriorate. Or in other words, it is a position in a Credit Default Swap. The option is (hopefully) far out of the money, as by the time the loan is signed, the customer's financial situation is such that it warrants her to be creditworthy for the duration of the lending engagement.

Interestingly, the longer the tenor of the "underlying" (i.e. the loan) and the better the customer's credit rating at the time of the credit agreement's sign off (this is the "out of the moneyness" - to use again a derivatives trader's lingo), the higher the concavity (in finance lingo: "negative convexity") of the performance profile for the lender - i.e. the higher the risk.

Bankers were aware of this heavily skewed risk/return profile of their lending portfolio for many years- exacerbated by the high leverage ratios they use by financing their loans by over 90% with deposits and interbank loans. While they have been trying to balance their portfolio exposures via diversification (see good old Harry Markowitz), this could at best minimize exposures to the systematic risks, but not to the unavoidable idiosyncratic risks they encountered.

If one looks at the bank's asset portfolio this way, it should come to no surprise (extreme value theorists like Paul Embrechts (ETH Zurich) and Claudia Klüppelberg (TU Munich) - have shown this via subtle mathematical derivations) that the exposure to the tail of the distribution is far higher than in the case of a shorter term and at the money option - meaning that risks are much higher and more difficult to assess via traditional means (mostly based on "well behaved" probability distributions)

Banks can alter the interest rate, FX and even liquidity exposure via entering into synthetic derivatives (trading these risks off for counterparty default exposure) - but find it very hard to alter this "negative convexity" profile I had mentioned earlier.

Above and beyond, the famous 8% (of RWA) capital cushion is determined from a "well behaved distribution" - but doesn't by far suffice once the tail end is marginally "misbehaving" - as it does every now and then in the economy.

What to do? Banks welcomed the emergence of hedge funds and other interesting non banking financial "warehouseers of credit risk" and sold en masse (via CDS and CDO tranches) a lot of this "negative gamma" exposure (or so they thought). Under the analysts pressure to increase their ROEs, bank managers found a "conduit way" to churn this process in an industrialized fashion, by engaging in new such loans (also taking advantage of the low interest rates prevailing on their financing side) and off-laying more of these risks. What this did to the pricing structure of loans and their "collateral" (read real estate values) in the economy - is something by now best known.

What we're discovering is that the "negative gamma" has not disappeared (just like energy - analogous to the second principle of thermodynamics - doesn't disappear within a system), but got transformed into complicated series of counterparty exposures with lethal consequences - called by politicians today "systemic relevant". In consequence, if perhaps 25 years ago there was no institution "too big to fail" (in that its failure would not have jeopardized the entire cobweb of the global financial system), now the world is full of such institutions (even Hypo Real Estate - a bank most international non professionals wouldn't have heard of).

Prisoner is the global tax payer - as we've seen.

Lessons for regulators:

1. Don't let banking behemoths grow ever again to levels that make them "too big to fail". Bankers will skillfully explain that a large size of their balance sheet will allow them to optimize risk via diversification - that of course, we're painfully learning, via a safety insurance underwritten by the tax payers.
2. When assessing capital cushion against risk weighted assets, also assess "how fast can capital disappear, given certain adverse conditions": some of the most troubled banks in the global system were deemed as well capitalized under the new Basel II regime, only a year or so ago!
3. Limit leverage - including off balance sheet vehicles! It is the high leverage, not the inherent credit risk that stands as the main culprit to the current "over securitization mania". Were leverage ratios limited to "decent values", banks would have been less adamant to accumulating "toxic assets" -i.e. equity and mezzanine tranches that deteriorate in value with "relativistic velocities", once the cascading process of loan delinquencies exceeds a certain threshold.
4. Finally, limit regulatory arbitrage among constituencies! An example is best illustrated by Prof. Sinn's tales of his friend from Banque de France, who admitted that their governor's committee decided that they'd render approval to new products, if at least one member of their illustrious board would "confess" to having understood the product. Unfortunately, they had to give up this "oath of faith" as bankers threatened to take their business to foreign entities (for instance the U.K.), where regulators were more forthcoming to their business quests.
5. Demand banks to keeping significant portions of equity tranches of securitized assets on their balance sheets. This will incent banks to

accompany their customers also through difficult times (read recovery portfolios, debt for equity swaps, etc.), as they share the first loss piece of credit driven delinquencies

6. Make a level playing field among risk warehouseers: Hedge Funds and other non bank financial institutions should keep the same levels of capital cushions against credit risky assets, thus eliminating regulatory arbitrage throughout the system
7. Penalize ex ante the “bail out option by the central bank”, letting bank managers think twice before endeavoring into high risk strategies, knowingly that there’s always the tax payer (also can insert FDIC) in the back to lend them a hand in need!

Lessons for industry analysts, rating agencies and bank managers:

1. It is not “growth of equity value” that determines the long term value of a company, but rather “sustainable strategic growth” - had analysts discounted the above referred risks into their stock price valuations, many bank managers would have been less prone to over leveraging their banks and would have been more conservative in their securitization vehicles’ usage
2. Align compensations and other incentives to sustainable strategic growth indicators, such as franchise metrics, customer service and- volatility tempered profitability metrics. Let brainy financiers use their creativity towards these targets as opposed to working to meet short term profitability goals
3. Rank management abilities by the above mentioned standards in your ratings
4. When making the strategic decision to outsource the warehousing of credit risk, via securitization - don’t look at default correlations in a “static” way (as it has been done thus far by means of copula functions inherent in portfolio models), but rather employ sound business judgment to gauge default dependencies in stress scenarios - i.e. when they really matter: an exposure to a company may well correlate negatively with your portfolio under normal conditions, but it may well turn around when economic conditions change radically, as we’ve painfully seen.