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Gold collateral: too worthy to be worth the early redemption

A paper by Battauz, De Donno and Sbuelz suggests when to redeem a loan with gold as a collateral

Collateralized borrowing has been seeing a significant surge after the financial crisis. Sovereign bonds and stocks are the collateral traditionally accepted by financial institutions, but gold is increasingly being used around the world. A conspicuous example is the Indian gold-loan market. Major Indian financial companies have been quite active in lending against gold collateral. Gold loans tend to have short maturities and rather high spreads (borrowing rate minus risk-free rate), even if significantly lower than without collateral. The prepayment option is common. It is an American call that allows the borrower to redeem the pledged gold at any time up to the loan maturity by paying a strike price equal to the borrowed amount plus the matured interests. Importantly, gold is a peculiar commodity, which is much akin to a tradable investment asset with storage/insurance costs (usually proportional to the bullion price) but no payouts.

In their paper "Real Options and American Derivatives: The Double Continuation Region" forthcoming on *Management Science* (published online as an Article in Advance at http://pubsonline.informs.org/doi/abs/10.1287/mnsc.2013.1891) **Anna Battauz** (Department of Finance), **Marzia De Donno** (Department of Decision Sciences and Università di Parma) and **Alessandro Sbuelz** (Department of Finance and Università Cattolica) show that gold's peculiar status entails a peculiar optimal exercise policy for the American prepayment option involved in gold loans.

They find that gold collateral redemption is optimally postponed not only when the underlying collateral value is poor but also when it is excessive. Their findings extend the classical analysis of optimal decision making for American option holders. Given a positive risk-free rate, it is well known that it is always suboptimal to exercise prior to maturity an American call on a tradable asset which offers no payouts. If the borrowing rate had been zero, such a standard result (no prepayment) would have applied as holding gold implies no earnings and is burdened with the storage/insurance cost. A positive borrowing rate that dominates the risk-free rate introduces a prepayment incentive for the borrower. When gold is markedly dear, such an incentive is overpowered by the storage/insurance cost. However, the storage/insurance cost is not always overwhelming and immediate prepayment does occur when gold is moderately pricey. In *Real Options and American Derivatives: The Double Continuation Region* the authors work out a closed-form solution for the gold-loan prepayment option in a perpetual diffusive-risk setting. They complete their study by providing suitable approximations of the time-varying boundaries that separate the immediate redemption region from the (two) no-prepayment regions in the finite-maturity case.

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