

Alternative technique of pricing without martingale measure

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Pricing a contingent claim is a classical problem in finance but that can be difficult in incomplete markets because, under NA, there are an infinite number of risk neutral probability measures to identify. Moreover, the minimal super-hedging price is also difficult to compute as the supremum of the expected discounted payoff over all martingale measures. Actually we show that, in discrete time, we may compute the infimum of the super-hedging prices without any no-arbitrage condition when the payoff is of the form $g(S_T)$. When g is convex, we also have an explicit and simple expression of the hedging strategy. The technique is interesting because it may be also applied to Asian or American options. Moreover, the same approach applies to models with transactions costs even if they are non convex so that they do not have dual elements characterizing a possible no-arbitrage condition.