Let's Go Do The Swap

With apologies to Danny and the Juniors...

You can trade it you can groove it
You can really start to move it
When you swap
Where the cash flow is the smoothest
And the savings are the coolest
It's the swap
All the cats and chicks
Can really show their tricks
With the swap

The phrase "why buy when you can rent" has been applied to human endeavors ranging from romance to finance and all points in between. One of the financial markets' remaining holdouts to simply exchanging the cash flows on an underlying notional principal - renting an asset - instead of tying up precious balance sheet capital on a purchase has been the equity market.

We can quibble over the reasons for this dereliction, but a central cause has been the way stocks are treated, both in the legal sense and by the great Wall Street sales machine. Legally, stocks represent shares of ownership, which is far more than the financial claim represented by all derivatives. On the distribution side, stocks are sold as a ticket to a dream, and representing them otherwise simply coarsens the sales pitch.

A New World Order
With the advent of single stock futures, we should expect the equity swap market to grow and take its rightful place alongside multi-trillion dollar interest rate, energy and currency swap markets. At its most basic, any swap is simply an exchange of cash flows and risk profiles. The standard words of art are "fixed" and "floating." A payment is fixed if its price is known and remains invariant over the life of the trade. All futures contracts settle into a fixed price over the delivery period, and all stock prices are fixed at the moment the trade is executed.

A price is floating when it remains to be determined. This is far more common in physical markets than is understood by those outside of these businesses; most natural gas contracts, for example, are based on prices floating with an index such as *Gas Daily* or *Inside FERC*. The fixed price paid for each day's delivery is based on this index, plus or minus a negotiated differential.

We can divide swap participants into two categories, fixed-rate payers and floating-rate payers. In a bond swap transaction, a fixed-rate payer borrows at a fixed rate and lends at a floating rate; he is said to be short the bond and long the swap. This position will profit if interest rates rise. The floating-rate payer does the opposite, borrowing at a floating rate and lending at a fixed rate; he is said to be long the bond and short the swap. This position will profit if interest rates fall. As is the case for options, these terms can be confusing until they become second nature, and are summarized below for your reference.

Swap Payer Profiles

	Fixed Rate	Floating Rate
Borrows at:	Fixed rate	Floating rate
Bond future equivalent:	Short	Long
Swap position:	Long swap	Short swap
At risk to:	Falling yields	Rising yields
Profits from:	Rising yields	Falling yields

In all cases, swap participants avoid exposing themselves to the credit risk of the underlying principal. Payments are made on periodic settlement dates, and default only risks the amount of the payments, not the much larger amount of the underlying principal.

Futures and swaps have a symbiotic relationship. The fixed leg of a swap frequently is set as the present value of the futures forward curve for a given market, as seen in "Legs and Curves." A premium based on risk or volatility is added to the fixed leg, which is why so many swaps are created as LIBOR plus a differential. Swap traders use strips of futures to either fix their floating position or to float their fixed position. This is why the eurodollar market can trade close to one million contracts per day with significant activity in the back months without interest rates changing much at all. By contrast, the federal funds contract, which is employed for the standard hedging function of locking in a borrowing or lending rate for the following month and for speculating on the Federal Reserve's next move, has a steady but unspectacular volume in the tens of thousands each day.

Legs And Curves
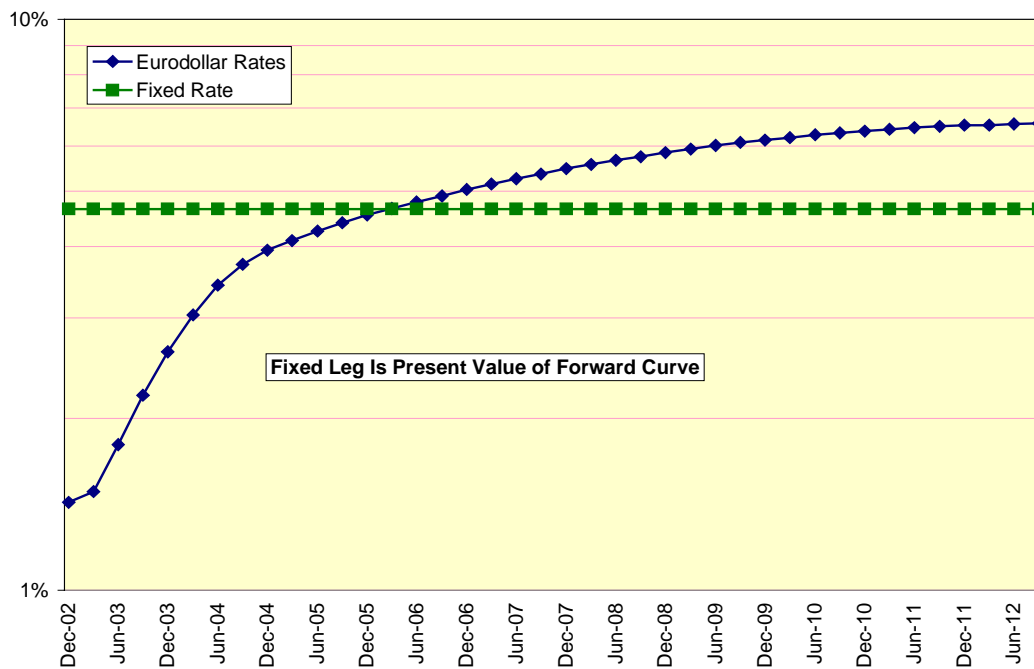
Collars
Had Horace Greeley lived on Wall Street today his dictum "Go west, young man" would read "never ask 'em to pay anything up front." The real reason we go through the exercise of calculating a fixed leg equal to the present value of the forward curve is neither side is obligated to pay any cash up front for their position. This delusion of being able to obtain something for nothing persists in the options world as well, where a long call or put option often is paired with a short put or call option, respectively, to create a costless collar.

Costless, and most likely worthless as well: If your need is to cap the price for something, just buy the call and be done with it. Why do you want to accept the complementary position of being short the put? Your natural cash market position will benefit from lower prices if you are seeking protection from higher prices, and to return this bounty is foolish. If we view options as insurance - and we should - we have to ask whether we would be willing to pay our auto insurance company an additional premium if we do not get into an accident. Of course not, but that is exactly what a costless collar does in a financial market.

Still, this is what the market wants, and the first rule of selling is to find out what your customer wants to buy. Moreover, the creation of costless collars around any stock or index provides us with information on where to set the risk premium. Let's use ChevronTexaco (CVX) and the data below from November 26, 2002 as an example. In order to create a costless collar, we need to fix either the put strike or the call strike and then search for a strike on the opposite side whose premium received will offset the premium paid for the fixed leg.

CVX Costless Collar: Fixed Put

Stock:	$	66.2800			
Put strike (90% of stock):	$	59.6520	Price $	6.7618	
Calculated call strike:	$	72.2612	Price $	6.7618	
Trade date:		11/26/02			
Expiration date:		11/25/03			
One-year implied volatility:		36.85%			
Dividend yield:		4.25%			
Interest rate:		1.44%			

A second block of information is required to calculate the swap, and that is the fixed leg. We can compute this by taking the present value of the 2003 quarterly futures on CVX; the average price of $64.48 is well below the $66.28 price of the stock due to the effect of the dividend (see "Death, Taxes, and Single Stock Futures," *Futures*, December 2002). At $64.48, the buyer of the futures strip is both paying for the foregone interest expense of holding the stock and is being compensated for not receiving the dividend.

CVX Forward Curve: Quarterlies Only

Cash price of CVX:	**$**	**66.28**				
Futures			Rate	Expiration	Present Value	
Mar-03	$	65.88	1.428%	3/21/03	$	65.59
Jun-03	$	65.34	1.468%	6/20/03	$	64.80
Sep-03	$	64.93	1.560%	9/19/03	$	64.11
Dec-03	$	64.57	1.700%	12/19/03	$	63.42
Present value of 2003 strip:	**$**	**64.48**				

Swaps come in various forms. The one that stands ready to turn the world of equities on its ear is the total return swap.

Total Return
Financial instruments can provide a return to investors in one of two ways, capital gains when the asset is sold, or an ongoing stream of dividends or coupons. Franco Modigliani and Merton Miller won the Nobel prize in economics for demonstrating, amongst other principles, that in the absence of distortions such as taxes, the value of a firm to its investors should be independent of how the total return stream is generated.

However, try though we might, we cannot ignore taxes. The U.S. tax code creates a powerful incentive for firms to minimize dividend payouts. The total return stream is shifted toward capital appreciation, which lengthens the effective duration of a stock in the same manner as lower coupon yields increase the effective duration of a bond. Lost in the euphoria most investors feel while holding an appreciating stock is the ugly reality their risk is increasing as well: Unless you sell some of that stock and pay the appropriate capital gains tax, you are playing a poker game with your entire stake at risk each hand.

An additional force, managerial compensation via stock option grants, skews the total return picture as well. The price of a stock falls as the dividend is paid, and since the options are linked to capital appreciation, not total return, the very same managers who decide dividend policy benefit from total returns in the form of capital appreciation. The unfortunate truth is people who are given an incentive to act in their selfish interest avail themselves of these opportunities on occasion.

Taxes And The Killer App

Taxes create trading opportunities. A large number of institutional investors, most prominently pension funds, university endowments and 501(c)-3 foundations are tax-advantaged, as are offshore hedge funds. Individuals are familiar with tax-deferred accounts such as IRA's and 401(k)'s. These accounts should prefer to receive their returns more in dividends than in capital appreciation as the dividend stream is untaxed and the lower capital gains tax rates do them no good. Moreover, the dividend income both lowers the risk of holding the stock and can be reinvested at the holder's discretion.

The setup is now clear: A tax-advantaged investor should want to swap capital appreciation for current income. If a low- or zero-dividend stock is appreciating rapidly in price, as many tech stocks did in the late 1990s, the total return may be quite high. This may delight risk-seeking investors in high tax brackets and option-gorged executives, but not tax-advantaged investors.

The total return for a zero-dividend stock is easy to calculate; it is simply the price appreciation over the holding period. The calculation of total return for a dividend-paying stock involves making assumptions as to reinvestment costs, including both commissions and bid/ask spreads, whether the dividend is received in cash or reinvested in the stock, and what the effective tax rate is for the dividend. For CVX, the simple price appreciation over the year preceding the analysis was -22.2066%. If we reinvested the $0.70 quarterly dividends in the stock and paid $0.01 per share to do so, the loss narrows to -19.4037%.

A total return swap monetizes capital appreciation. A tax-advantaged floating rate receiver can get paid on the period's total return over the top end of a target range even if the stock is neither sold nor pays a dividend. The downside of this position, of course, is that the floating rate receiver has to pay if the stock falls below the low end of the target range. Effectively, the floating rate receiver is long an out-of-the-money call and short an out-of-the-money put, the opposite side of the collar shown above.

In return, the fixed rate receiver will get paid a return over the financing rate. The fixed rate receiver's risk is now converted from being long equity to being long a high-yield bond plus the long put/short call collar combination. This option combination has a delta near -.78 at initiation and a negative gamma as well.

Both parties can both price this swap and hedge their risk by buying and selling the strip of CVX futures. The fixed rate receiver can buy the strip to offset the short collar, especially the short call option component thereof, while the floating rate receiver can sell the strip to hedge his short put option position. If other financial markets provide a valid basis for comparison, we should see numerous strip trades back and forth for strips of equity futures. This trade will be the "killer app," to borrow from the technology lexicon, for single stock futures.

The profit profile of a fixed rate receiver who has hedged his short collar at initiation with a long CVX future is shown below for the March 2003 segment of the trade. The loss zone for this trade occurs at lower prices; the long future loses more than the short collar gains. Conversely, the profit zone occurs at higher prices. The incentive to trade the futures directionally with such a profile is apparent.

Long CVX March 2003 Future / Short Collar
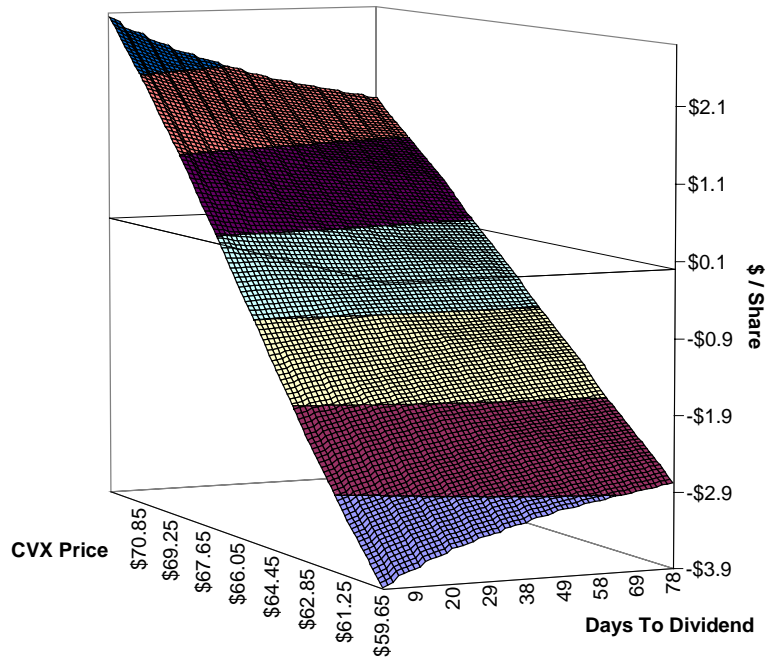
The Price of Risk

How much will the fixed rate receiver need to be compensated for assuming the risk of the short call option? The answer depends on where the strike is set for the short call within the costless collar. Full compensation in the above case for a $72.2612 call priced at $6.7618 against the stock price of $66.28 is 850 basis points over one-year LIBOR, or [$6.7618/$66.28 - 1.70%]. If measured against the one-year strip, the rate would rise to 879 basis points. The range of compensation required can be visualized below in the dimensions of both fixed rate premium received and probability.

Setting The Strike
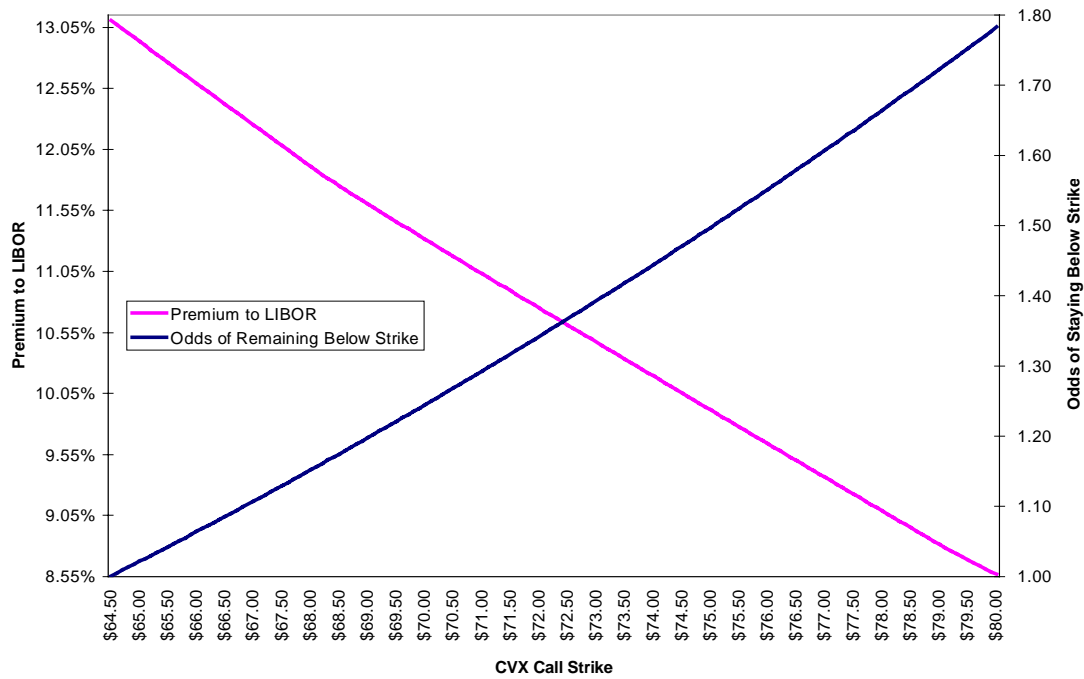
The closer the short call strike is to the futures' strip price, the greater the price of the call, and the lower the odds of CVX' price remaining below the strike price. The fixed rate receiver will need to get paid a much larger premium to LIBOR in compensation for being short a call so close to the current price. As the range of the collar expands, the opposite occurs, and the fixed rate receiver will get paid a lower premium in exchange for assuming less risk.

January 1, Year 1
One odd aspect of financial revolutions is how unaware participants are of their contemporaneous unfolding and of the magnitude of what they are experiencing. This was true of floating exchange rates, equity option, interest rate futures, equity index futures, collateralized mortgage obligations and of all swaps. In all of these cases it would be impossible for current market participants to imagine without these markets staring back at them from the screen. This will be the case for equity investors and single stock futures.