Convexity Maven

A Commentary by Harley Bassman

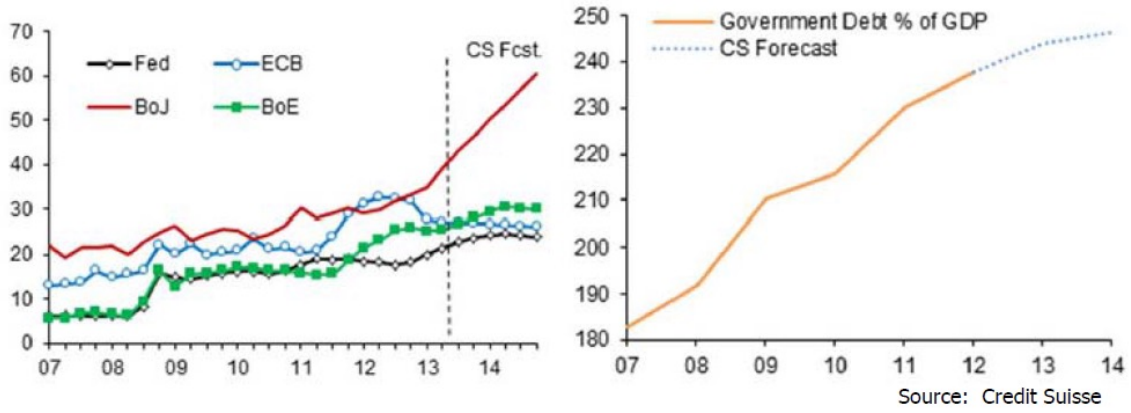
July 29, 2014

"Money for Nothing ……."

Dire Straits - 1985

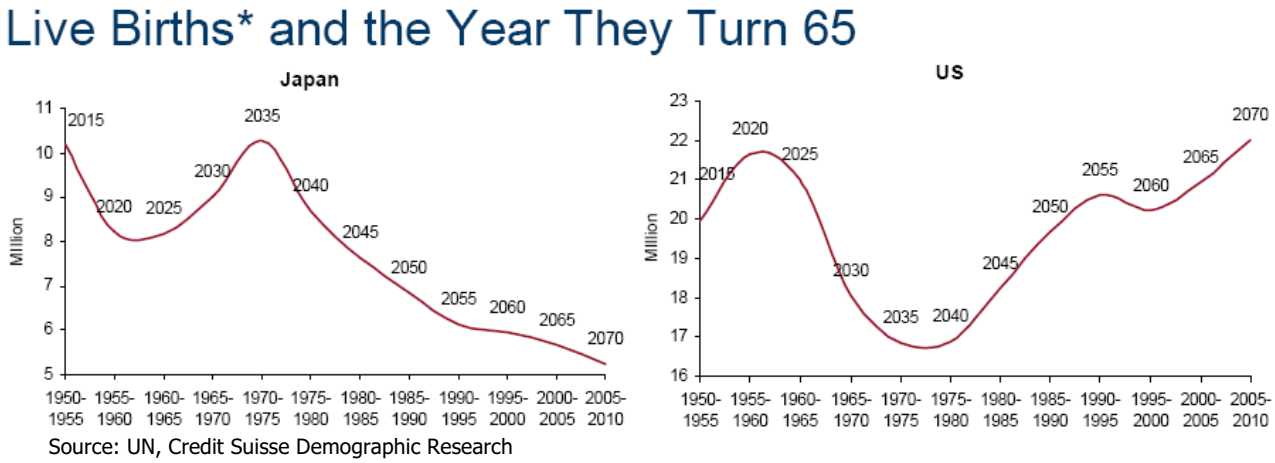
It is a curiosity that the Preacher places too much earnest effort into weaving together such a compelling sermon each Sunday when those in the pews are already so well convinced. Such is the case that I wonder how long a Commentary focused upon shorting the Japanese Yen might stay upon your desks before reaching the circular file. But while this missive will quickly review the fundamental risk profile, the main event is to describe a better execution that will ultimately provide a greater return for substantially less risk. While it is not quite Rumpelstiltskin spinning straw into gold, this is as close as most of you will come to finding a free option.

The most committed of the "Japan bears" focus upon the fact that by many macro-financial measurements, Japan is worse than Greece; and as the MOF and the BOJ mimic Pickett and charge up the mountain of money they have printed, these metrics can only worsen. Under the Nom de Guerre of "Abe-nomics", the -rose line- below is a projection of how BOJ will soon drive their debt to GDP ratio –poppy line- to nearly 250%, a level that only Paul Krugman would not fear.



But as the widows of the "Japan trade" should have learned by now, this alone is not enough to purely justify a large risk that Japan's financial foundation will soon crumble. The vastly more salient issue is their rapidly aging demographic.

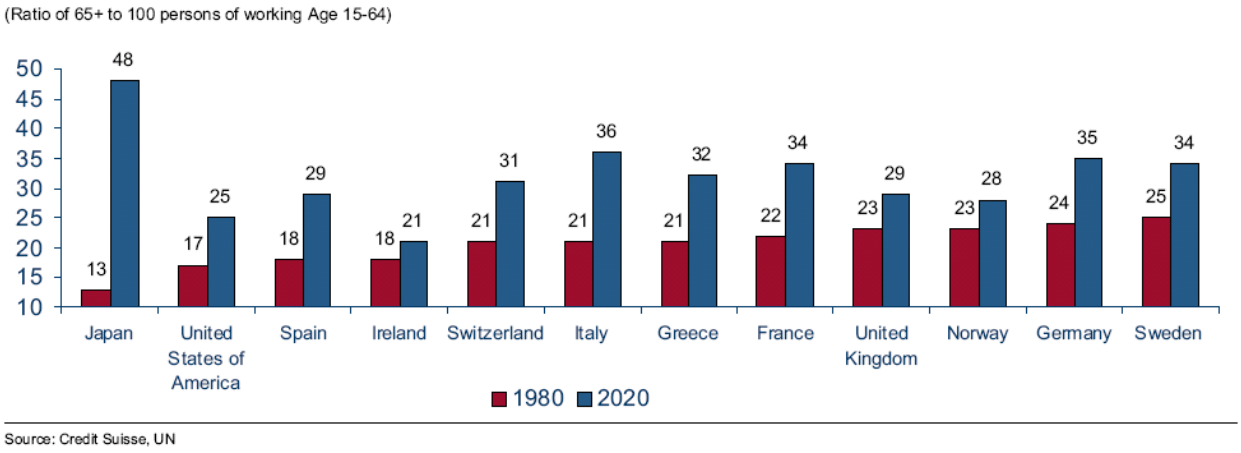
While Governments can use their sundry powerful tools to manipulate Interest rates and Inflation, sans a centenary redux, it is nearly impossible to shift a demographic profile.



The chart above on the right is the US birth demographic since 1950. The early bulge is the "Baby Boomer" peak in 1957. On the left is the Japanese demographic. Notice how both nations had a similar post-war surge in births.

The divergence since then is the problem. While the US has experienced another population surge in the last few decades, known as the "Echo-Boom", a similar pattern has not occurred in Japan. As such, the profile of the Japanese demographic is quickly changing, with an accompaniment of significant negative economic consequences.

The -carmine bars- below represents the "worker bee to geezer" ratio for a range of our Western peers in 1980. Specifically, it is the ratio of the population that is over the age of 65 versus those of working age between 15 and 64. The –liberty bars- reflect a projection of this same ratio only a few years hence in 2020. Over the course of a generation, the Japanese demographic has traversed from the best to the worst from the standpoint of economic productivity.



Source: Credit Suisse, UN

We can draw two interesting conclusions. First, there should be no surprise as to what supported Japan's rise to an economic powerhouse in the 1980's, they had a superior demographic. Second, there is the unhappy corollary that the aging of the Japanese population could be economically disruptive in the mid-future.

It seems likely that as the population ages and productivity declines, more resources will be directed to the elderly and their current account trade flows will turn negative. Unlike the US, the national debt of Japan is funded internally; so when it comes to pass that they must externally fund the issuance of JGBs, that will be the moment that their interest rates rise, and the currency tumbles. While this denouement is a near certainty, it's timing likely to be two to five years away.

This should be a prime consideration when one is looking to gain exposure to this risk vector. Outright Interest Rate shorts are difficult as they are both expensive (negative carry) and expose one to potentially large (and unlimited) short-term losses. Buying short-term options can limit losses, but still exhibit negative theta. And while a JPY currency short does carry positively, it can still deliver a knock-out blow via a harsh mark-to-market twitch.

Our preferred strategy is to take advantage of a market anomaly that enables one to buy an option that initially exhibits positive carry. This is neither "financial magic" nor an "option special"; this is a plain vanilla option that can be priced and valued on Bloomberg. Rather, it is merely the interesting mathematical paradox between a Rate process that is linear and an option Time process which is Logarithmic.

In a nutshell, interest income is linear to time so two years of coupon payments are twice the size of a single year's value. In contrast, an option's price increases with the square root of time, so a two-year option is only 1.4 times greater in price than a one-year option.

As detailed in my July 16, 2014 Commentary – *"Ace in the Hole"*, a combination of forces related to the FED's policy of Financial Repression has distorted many fundamental relationships. Particular to JPY options has been the strange circumstance of a widening USD vs. JPY Rate differential in conjunction with a flattening Volatility term surface.

The table below highlights this conundrum: The –azure column- lists the mid-market values for Par strike USD call // JPY put options with expiries from one-year to ten-years.

	Expiry	Forward Px	Strike	Implied Vol	Option Px	Delta	Theta
					Call Option		
Spot Fx	>>>>>>	**102.11**					
	1y	101.70	100.00	7.7%	$3.96	56.2%	-$3.96
	2y	100.40	100.00	8.6%	$4.98	48.7%	-$1.02
	3y	98.08	100.00	9.3%	$5.39	42.9%	-$0.41
	4y	95.17	100.00	10.0%	$5.56	38.2%	-$0.17
	5y	92.13	100.00	10.7%	$5.76	35.0%	-$0.20
	6y	89.15	100.00	11.5%	$6.08	32.7%	-$0.32
	7y	86.30	100.00	12.0%	$6.18	30.9%	-$0.10
	8y	83.62	100.00	12.4%	$6.25	29.5%	-$0.07
	9y	81.01	100.00	12.7%	$6.19	28.2%	$0.06
	10y	78.63	100.00	12.9%	$6.09	27.2%	$0.10

Specifically, notice that the price for a ten-year option actually increases for the first few years on a pure "roll down" calculation. While not quite "free", the purchase of a ten-year option does allow a portfolio manager to gain unlimited upside exposure to a crumbling JPY with effectively no carry cost for the first four years.

The Trade: Buy ten-year expiry JPY put / USD call; K = 100 @ 6 ½ points.

This risk profile fits hand in glove with the fundamental concept that it will take more than a few years for the Japanese population demographic to overwhelm their static monetary profile.

Expect at least a 25cent cost of entry, but it should be well worth that expense. For a price of less than 6 ½ points, one can reap an unlimited profit with a known downside. This will allow the PM to take on a greater nominal exposure relative to his mark-to-market limits for this risk vector.

While these options would never be described as liquid, a position can be built up over time as dealers have exposure to long-dated options via their issuance of PRDC structured notes.
[http://en.wikipedia.org/wiki/Power_reverse_dual-currency_note]

On a final note, while we do not love the idea, the upfront cost of a ten-year K = 100 option can be reduced be concurrent sale of OTM USD put // JPY calls. The "best" sale would be a five-year option struck at 80 for about 4 ½ points. This expiry locates at the widest rate differential and has a pleasant decay pattern. The more interesting sale would be a ten-year option struck at 60 for 6 ½ points. What makes this interesting is the ability to enter into a 60 vs 100 "risk reversal" at no cost. Please note that both of these alternatives are in intellectual conflict with the main premise of this Commentary.

Harley S. Bassman
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