Topics: Japan; the Fed and the continuing market melt-up; a Spanish Madriddle; and the Tesla solution

What happened in Japan last week (a 10% decline after a 70% rally since last fall) is an example of markets getting ahead of the facts on the ground. How much optimism was priced into the success of Japan's monetary policy bazooka? P/E multiples rose from 11x to 17x since last Labor Day, and breakeven inflation implied by (admittedly thin) Japanese JGB-i bond markets rose to 2%, a level Japan has not seen consistently since 1990. On top of that, net long positions on the Tokyo Stock exchange were close to the highest levels in 20 years, and foreign participation in Japanese equity markets was also elevated. In case you think I am mentioning this only after the fact, our April 16, 2013 *Eye on the Market* showed these very charts. It did not take much detailed market research to see that Japan had become a crowded and popular trade.

Another optimism test: how frequent are 70% equity market rallies over just 6 months? The table below shows all the episodes of 70%+ stock market rallies in a six-month time span one can find across major markets throughout history. There aren't that many, and the color schemes denoting the years in which they occurred show that many of them don't last. So, it's not a surprise that some profit-taking led to a larger selloff, with the alleged impetus being another weak industrial survey out of China, and concerns about the interest rate sensitivity of regional Japanese banks.

Six-month equity market rallies of 70% or more

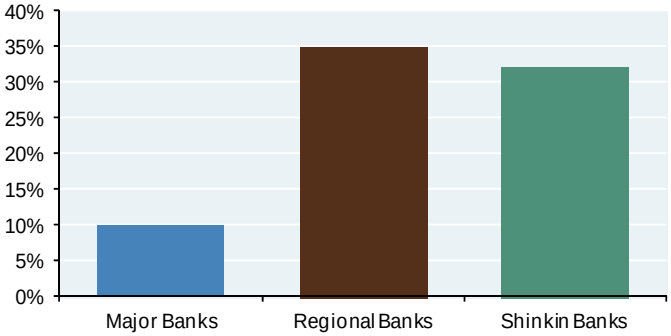
Country	Since	Episodes	When
Japan	1949	1	2013
US	1927	1	1933
Germany	1959	None	
UK	1970	1	1975
Canada	1970	None	
Australia	1970	None	
Switzerland	1970	None	
Korea	1988	2	1998-99, 2001-02
Sweden	1970	2	1983, 2000
Italy	1970	3	1980, 1986, 2009
France	1970	1	1986
Hong Kong	1980	4	1980, 1985, 1994, 2009

Source: Bloomberg, Datastream. May 2013.

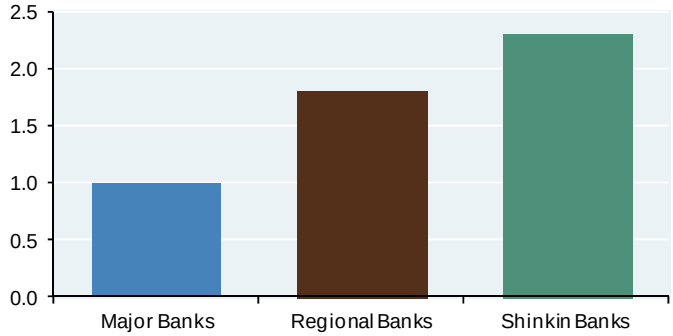
What happened next?
Rally sustained
Rally reversed/collapsed

On regional Japanese bank interest rate sensitivity, the Bank of Japan has been providing this information for a while. We have been able to ignore it, since the last time 10 year interest rates were above 2% in Japan, Netscape Navigator was the most popular web browser. But now, with interest rates rising, we need to pay attention. As shown below, while the mark-to-market and maturity mismatch risk of major banks in Japan looks manageable, the same cannot be said for regional and "shinkin" (cooperative) banks. As we learned in Spain, regional banks can cause a disproportional amount of problems.

Japanese banks: mark-to-market asset loss as percent of capital for 1% increase in JGB yields



Japanese banks maturity mismatch between assets and liabilities, Years



Source: BOJ, April 2013 (both charts).

To prevent a problem with here, Japan will need the BoJ to intervene to prevent yields from rising, and some good economic data as well. Earnings and business sentiment is improving, exports are rising, and there are signs that small-ticket consumer purchases (supermarket sales) are rising as well. However, hours worked, housing starts and retail sales are still weak, and the recent growth spurt in Japan may simply be another temporary weak-Yen bounce. **The mega-experiment will continue in Japan, and I do think that the policy mix in Japan is more aggressive and deeper (including structural reforms) than prior ones. But to me, the easiest money of being long Japanese equities and short Yen has already been made.**

The Fed. The Federal Reserve is beginning to lay out a framework for ending its asset purchases, and for eventually (2015?) raising policy rates. The consensus view is that markets will digest this calmly as long as growth is doing well. Perhaps, but keep something in mind: since the Greenspan-Bernanke era of using cheap money to solve economic problems began, equity market volatility has been considerably higher than other periods during the 20th century, other than the WWI-Depression-WWII period. It has been even higher than before the creation of the Federal Reserve in 1913, when the U.S. was beset with frequent depressions and bank runs. The table below goes through the details, by era and by Fed leadership. That doesn't mean that cheap money "doesn't work", or "isn't the right thing to do"; history will be the judge of that. But it does mean that sometimes,

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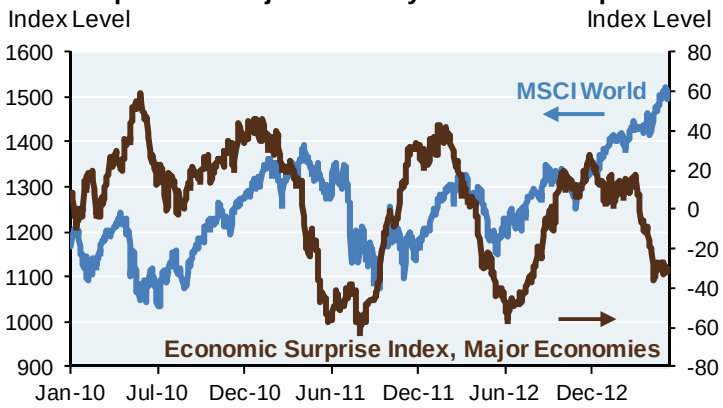
equity markets will run ahead of both profits and economics (as they have this year, as the melt-up continues this morning); that equity markets will be volatile; and that there are risks associated with eventual cheap money withdrawal.

The volatility of equity markets by period and by Fed era

	Start	End	DowJones volatility	Comments
Periods of time	5/1896	12/1913	18.3%	Pre-Fed period, frequent recessions and depressions
	1/1914	12/1947	23.1%	WWI, Great Depression, WWII
	1/1948	12/1963	10.9%	Post-war recovery and bull market
	1/1964	12/1982	13.5%	Vietnam War, OPEC, Nixon, Inflation/recession
	1/1983	12/1999	16.2%	Volcker disinflation and equity bull market
	1/2000	**5/2013**	**20.5%**	**Tech collapse, credit/housing bubble boom/bust**
Fed Chairmen	**8/1987**	**5/2013**	**18.8%**	**Greenspan/Bernanke era of cheap money**
	2/1970	8/1979	14.8%	Inflationary chairmen: Arthur Burns, G William Miller
	4/1951 8/1979	1/1970 8/1987	11.8%	Tight money chairmen: Volcker, McChesney Martin
	11/1934	1/1948	16.8%	Marriner Eccles
	12/1914	9/1927	18.3%	Pre-Depression: Hamlin, Harding, Crissinger

Source: Bloomberg, J. P. Morgan Asset Management

World Equities vs Major Economy Economic Surprises



Source: Bloomberg. May 2013.

All things considered, the world's central banks never promised you a rose garden of endless low volatility and double-digit equity market gains. Cheap money solutions have their benefits and pitfalls, and as discussions continue about eventual Fed tightening, one should expect market volatility to pick up. For long-term investors, that's not necessarily bad news. Even if global equities end the year with 10% gains (they are currently up 13%), a "normal" investment approach would still reward clients following it. We see 2013 as a year of improvement, but one that is not strong enough to set a global policy tightening cycle in motion; the day of reckoning for that looks more like a 2014 or 2015 issue. As shown in our May 14th EoTM, some of the world's largest economic imbalances have been healing, which should offset some of the risks around stimulus withdrawal.

Another Spanish Madriddle: should Spanish GDP data be taken at face value?

Sometimes, Spanish economic data don't make sense. Example: as unemployment rose from 10% to 25% from 2008 to Q2 2012, Spanish banks reported stable non-performing loans of 3%[1]. The latest Mad-riddle has to do with corporate profits. Earnings for companies in the MSCI Spain Equity Index boomed during the mid 2000's, when leverage and consumption in the Periphery were rising. They then fell sharply during the recession. On the other hand, the non-financial gross operating surplus for the Spanish private sector show a consistent rise. It's not uncommon for non-financial operating surpluses to be less volatile than earnings of public companies, as in the U.S. **But the Spanish pair don't even rhyme**, and raise questions about Spanish data. One could discard this as a statistical aberration, except that gross operating surpluses are generally derived from the same data used to compute GDP. Other than a pick-up in exports, the rest of the picture in Spain still looks very grim: industrial production, real disposable income, domestic demand, imports, long-term unemployment, business loans, bankruptcies, etc. At some point, given the pace of decline in wages and asset prices, Spain should be able to attract foreign capital again. But you have to wonder if Spain can survive the journey.

Spain: economy-wide profits vs. public company profits

Source: MSCI, Instituto Nacional de Estadistica, Haver Analytics. May 2013.

US: economy-wide profits vs. public company profits

Source: BEA, S&P. May 2013.

[1] I am aware of all the explanations (recourse mortgages, support from families, low benchmark rates and low original LTVs), but I find it hard to believe that residential mortgage NPLs were really that low. They are now apparently rising.

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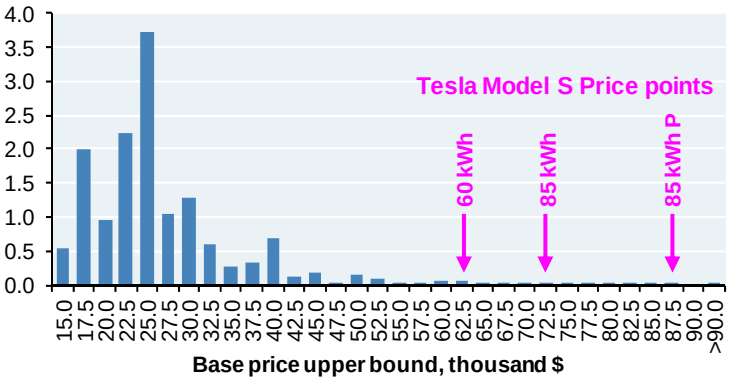
The Tesla Solution

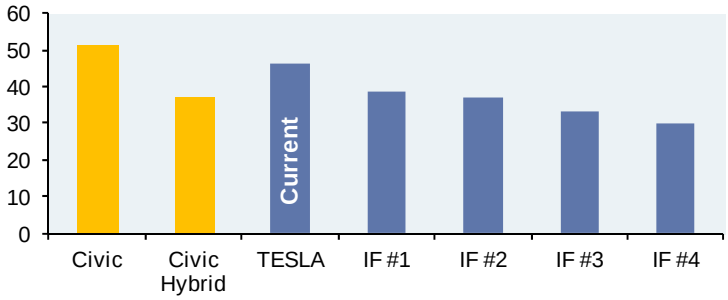
I was talking to Vaclav Smil last week, discussing topics we plan to write about in our annual fall energy *Eye on the Market*. As a preview, we will revisit what's going on with electric cars, part of which will be an update on Tesla. Tesla has been outselling specific Mercedes, BMW and Audi models at similar price/quality points, and Consumer Reports has given the car glowing reviews. Is there a broader meaning in this, other than the introduction of a very well-designed luxury automobile? Vaclav's view: **the Tesla's price and its fossil fuel footprint suggest that it's a distraction regarding the issue of transportation and related environmental efficiencies**. I pulled together some charts to illustrate both of his points. Note that Tesla prices are net of the $7,500 credit that buyers receive, and after Tesla benefits from ZEV/GHG credits paid to it by its competitors. In the 2nd chart, you can see that the current fossil fuel footprint of the Tesla is not much different than the Honda Civic. It's also higher than the Civic Hybrid, a car that gets all of its electricity through regenerative braking rather from than the electricity grid.

2012 US vehicle sales by base price
Million units



Source: Ward's, Edmunds, Autodata, Tesla Motors, JPMAM.

Currently, the "zero-emissions" Tesla Model S generates a fossil fuel footprint that is not much different than the Honda Civic. There are scenarios in which the Tesla's imprint could be lower, but they are all in the future
Gigajoules of energy from fossil fuels required per year



Sources: EIA, Oak Ridge National Laboratory, Tesla, EPA, JPMAM.

An explanation of the scenario analysis in the second chart:
Tesla, Current: see table on next page for the energy math.
If #1: Assume that Tesla figures out how to reduce the vampire (standby) electricity loss by 80%, an issue in the car's software which some users report as draining ~3.5 kWh per day from the battery when the car is idle…
If #2: Assume #1, and that the split between coal and natural gas, which is currently 63/37, falls to 50/50 as older coal plants continue to be shut down and more natural gas plants are built…
If #3: Assume #1 and #2, and that fossil fuels fall from their current 67% share of US electricity generation to 60%. This sounds like a small change, but they have ranged from 65% to 72% for the last 30 years in the US. For a larger decline, more nuclear and/or a break-through on battery storage of intermittent renewable energy would probably be needed…
If #4: Assume #1, #2 and #3, and that thermal efficiency of coal and gas plants rise closer to theoretical maximums. However, on coal, emissions standards and greater coal plant cycling impose parasitic loads that may make theoretical maximums hard to reach.

A colleague of mine here at J.P. Morgan believes that Tesla's long-range plan is to provide proof of concept at the luxury end of the market, and then eventually commoditize the concept at lower price points. If that's what happens, and if the electricity "ifs" shown above take place, then Tesla would merit the attention they're getting for current annual production of 20,000 units on a base of 15 million U.S. cars sold each year. Otherwise, what we may be witnessing is simply a green revolution where green represents the buying power of the Tesla's wealthy driver rather than a substantial environmental benefit. The broader point is that the oft-promised rose garden of substantially lower environmental footprints from electric vehicles may be decades away from blooming, at least in the US[2]. In the meantime, modest improvements in the internal combustion engine, changes in driving patterns and a move away from heavier, low-mpg cars could get to a similar place.

Next week: a piece we have been working on for a while, focusing on retirement dynamics for affluent families: the interplay of spending, saving, investing, retirement cash flow targets and changing government policy regarding taxation, entitlements and access to tax-advantaged savings plans.

Michael Cembalest
J.P. Morgan Asset Management

[2] In some countries, renewable energy makes up a larger % of total electricity generation than in the US. However, where renewables make up >30% of total generation, hydro-electric usually makes up 75%-100% of that amount (Austria, Brazil, Canada, Chile, Colombia, New Zealand, Norway, Paraguay, Venezuela, Sweden and Switzerland). Some exceptions: Finland, Portugal, the Philippines and Spain.

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The "zero-emissions" Tesla currently generates an annual fossil fuel footprint that's not that different than the Honda Civic

2012 HONDA CIVIC		TESLA Model S 85 kWh		Convert MWh of electricity into tons/GJ of coal	
1.609	km per mile	23.6	kWh per 100 km (a)	1,734	US electricity from coal, billion kWh, 2011 (d)
20,000	km driven per year	0.24	kWh per km	932,911	thousand short tons of coal used, US. 2011 (d)
12,427	miles driven in a year	20,000	km driven per year	1.86	MWh of electricity per ton of coal, US, 2011
32	miles per gallon (a)	4,722	kWh per year	0.54	implied tons of coal per MWh
388	gallons of gasoline	4.7	MWh per year	2.95	Tesla MWh of electricity per year from coal
0.132	GJ of energy per gallon (b)	3.5	kWh per day "Vampire load" [idling] (c)	1.59	Tesla coal requirement per year, short tons
51.3	**GJ of fossil fuel per year**	1.3	Vampire load per year in MWh	20.3	GJ per short ton of coal (d)
		6.0	MWh required at vehicle level	32.2	GJ of coal required per year
2012 HONDA CIVIC HYBRID		86%	Wall outlet charging efficiency (c)	**Convert MWh of electricity into mcf/GJ of nat gas**	
44	miles per gallon (a)	7.0	Total wall outlet electricity required MWh	1,017	US electricity from natural gas, billion kWh, 2011 (d)
282	gallons of gasoline	67%	% of US electricity gen. from coal and nat gas (d)	7,880,481	million cubic feet used, 2011 (d)
0.132	GJ of energy per gallon (b)	4.7	MWh of residential electricity req. from fossil fuels	0.129	kWh of electricity per cubic foot of nat gas, 2011
37.3	**GJ of fossil fuel per year**	63%	Coal's portion of electricity from fossil fuels, 2011	7.75	Implied mcf of nat gas per MWh
Note: Hybrid electricity generated		37%	Nat gas portion of electricity from fossil fuels, 2011	1.73	Tesla MWh of electricity per year from nat gas
through regenerative braking		**46.3**	**GJ of fossil fuels per year (see tables, right)**	13.4	Tesla nat gas requirement per year, mcf
				1.055	GJ per mcf of nat gas (e)
				14.1	GJ of nat gas required per year

Sources: (a) US Environmental Protection Agency; (b) Oak Ridge National Laboratory; (c) Tesla and Tesla user forums; (d) US Energy Information Administration; (e) Canadian Department of Natural Resources.
km = kilometer; kWh = kilowatt-hour; MWh = megawatt-hour; mcf = thousand cubic feet; GJ = gigajoules