

Bill and Rachel Ziemba

Three mini crashes in US and world equity markets

Bill and Rachel Ziemba take a look at the import of some recent, less than textbook, declines ...

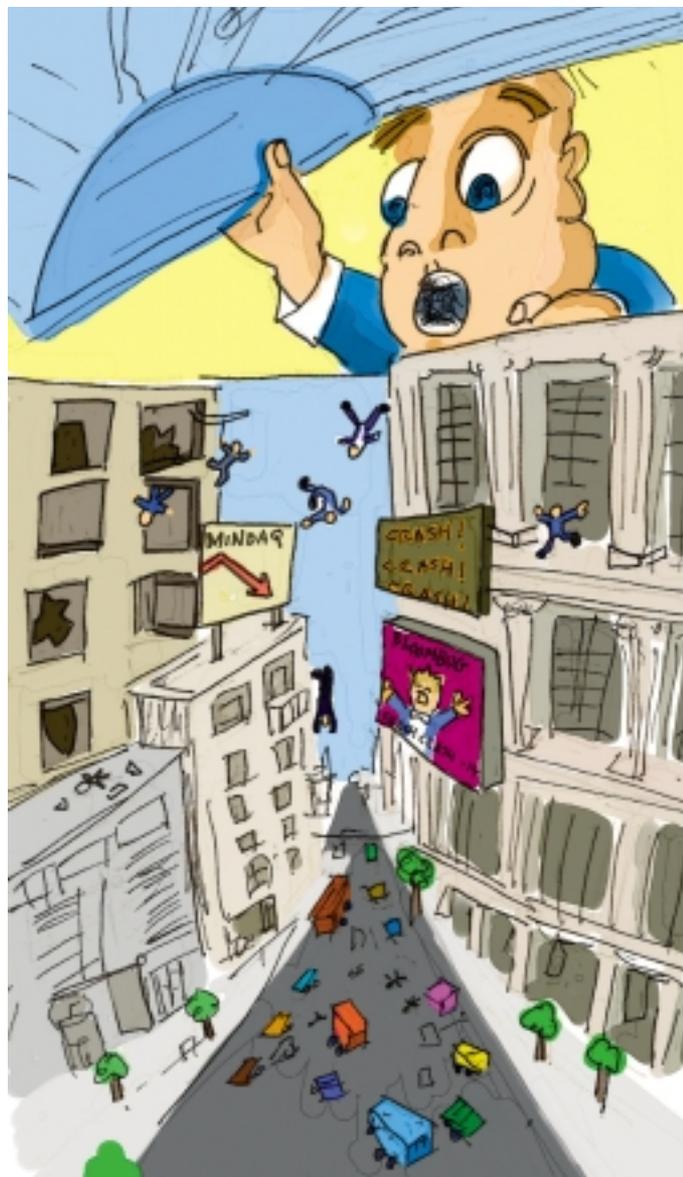
In past columns Bill has discussed two crash risk measures that are very effective for anticipating large ten per cent+ declines in the S&P 500 and other stock indices. These measures can help investors assess risks and minimize the effects of such crashes. In this column, we briefly re-review these two measures and explore three declines in the US and world markets that were not predicted by these measures. From this background, we try to draw out lessons for predicting and responding to such shocks in a variety of markets. The two measures are:

Bond-stock; which compares bond versus stock yields,
and

T-option: a measure of market confidence sentiment related to puts versus calls prices

The three declines not explained by the two measures are:

- September 11, 2001,
- May to June 2006, and
- February 27 to April 2007



Some background on crash measures

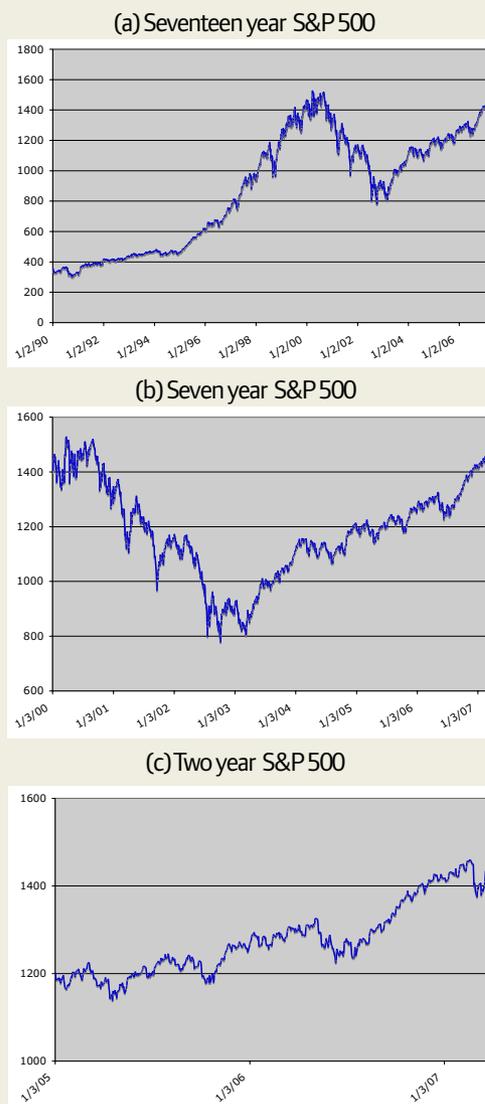
Historically, the bond-stock crash measure has been successful in predicting ten per cent+ market corrections, including the declines in October 1987 (U.S. and Japan), the 1990 Japan, the 2000 U.S. and the 2002 U.S. In Japan from 1948-1988, there were twenty ten per cent+ declines even though the market went up 221 times in yen (and 550 times in US dollars). The bond-stock measure had a 12/12 record in predicting crashes in that period, that is, whenever the measure was in the danger zone, there was a fall of ten per cent+ within one year from the time the measure went into the danger zone. This is a very good forecasting record, but eight declines in Japan during these 40 years were not predicted by this measure. Berge, Consigli and Ziemba (2007) present an analysis of this measure in five equity markets (US, Japan, UK, Germany and Canada) from 1970-2005. See also previous *Wilmott* columns. Similarly, the short term confidential T-measure WTZIMI uses in trading has good short term predictability (3-6 months). Since 1985 the T-measure has had six, that is, in the danger zone, for the S&P 500, six times. These are summarized in Table 1.

T is negative when the market is over confident as measured by relative put and call option prices. Then it is very dangerous since there are no sellers and only buyers but some sellers will usually appear to drive the market down. Of these six $T < 0$ occurrences,

Table 1: Results of the six times out of 85 quarters the T-measure was negative for the S&P 500

Quarter T	3Q 1986	4Q 1986	4Q 1987	4Q 1990	3Q 2002	3Q 2003
T	-3.20	-0.95	-3.50	-1.9	-142.8	-50.4
Strategy						
Return	2.278%	26.42%	-123.49%	-0.123%	-34.94%	-4.415%
	Profit	Large profit	Bond/stock measure in danger zone	Small Loss	T-measure worked well extreme danger zone	small loss
S&P Return	-8.20%	+3.70%	-24.50%	+4.80%	-12.00%	-4.5%

Figure 1: The S&P 500 fell 37 per cent from 1460.25 at the end of December 1999 to 885.76 on 31 October 2002



S&P 500, Daily over time. Source: yahoo finance

we have the October 1987 crash and the 3Q2002 crash when the S&P 500 fell 22 per cent in this quarter. The S&P bias trade is not done when $T < 0$; see Table 1. Otherwise the S&P bias trade of WIZIMI is very successful when $T < 0$.

From 1985, there were no losses for $T > 0$, as it has been since 3Q2003.

In the six quarters when $T < 0$, there were four losses and two times the measure did not predict correctly. Still the sum of the six returns yielded a combined arithmetic loss of -41.7 per cent. Hence, these two measures are useful but they do not predict all ten per cent+ crashes nor do they predict some small declines. For these two declines under ten per cent and the September 11, 2001 14 per cent decline, other reasons must be found, which we will consider below.

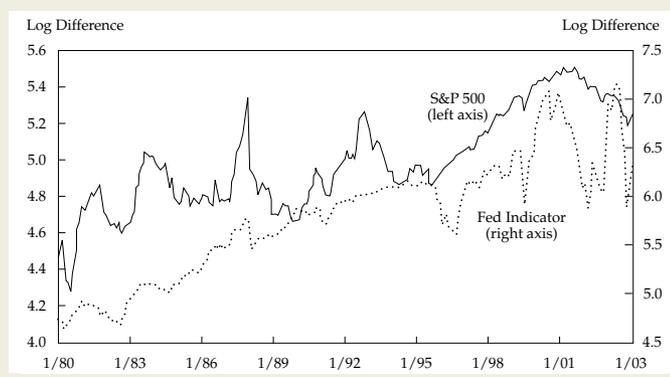
Declines and crashes not predicted by the measures

Although the measures have a good record, there are some key episodes which it did not predict. Studying these declines and their triggers helps us to assess shocks. The September 11, 2001 attacks and the stock market decline of 14 per cent in the S&P 500 that followed after a one week market closure was largely a random, that is unforeseen event. But the size of the decline was exacerbated due to the then weak stock market

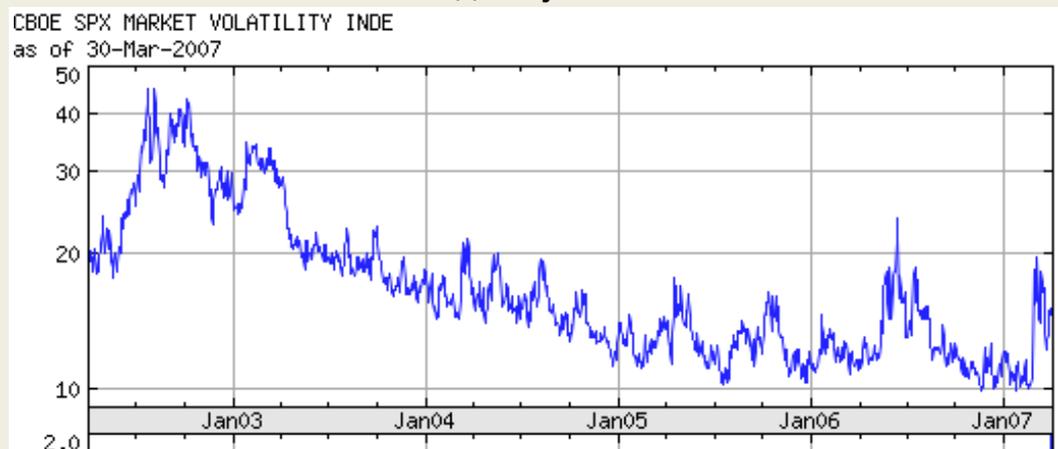
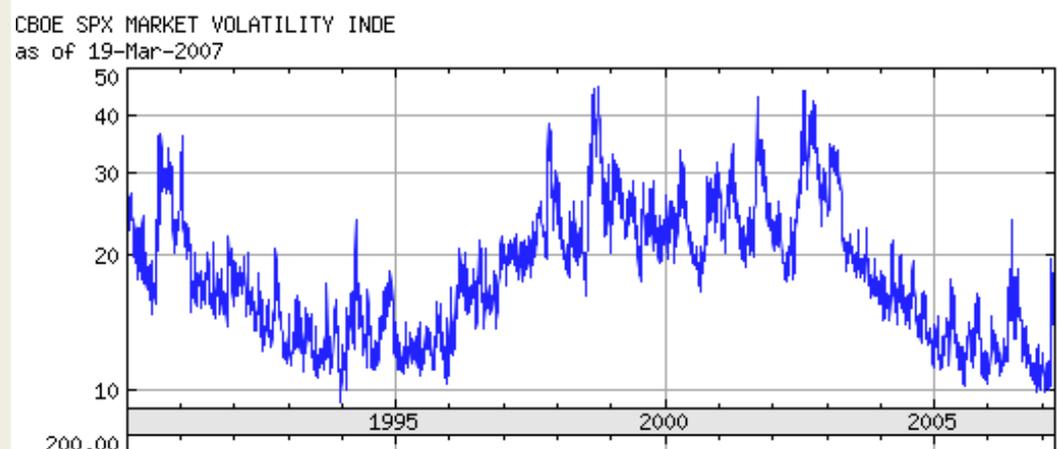
and U.S. economy which had a recession starting in spring 2001; see Figure 1 (a) and (b). The stock market was weak because although prices had fallen, earnings had fallen more. The bond-stock model which had been in the danger zone in April 1999, predicting the April 2000 decline, then returned to the danger zone in the fall of 2001 predicting the 22 per cent fall in the S&P 500 in 2002, see Figure 1. The T-measure for 3Q2002 at -142.8 predicted the 12 per cent fall in the S&P 500 that quarter; see Table 1.

In May to June 2006 the S&P 500 fell seven per cent and markets in some emerging economies fell 20 per cent or more. Worries that valuations of some emerging market stocks were too high enlarged their losses. For example, the closed end emerging market fund RNE (Russian New Europe) was at a very high 37 per cent+ premium on May 10 to net asset value - an amount way above historical values. The trigger for the decline was a rumor that the Bank of Japan would raise interest rates. These higher interest rates did not materialize but the fear that they would spark a rally in the yen led some yen carry trade players to unwind their short yen, long higher yielding non-Japanese asset positions, especially emerging market currencies. In turn this led to sales of various stocks and indices including the S&P 500 and the decline was largest (elements of mean reversion) in those areas that had gained the most, namely the emerging markets. The VIX volatility index, see Figure 3 rose from around ten per cent before the crisis to the 22 per cent level before dropping back to ten per cent after the sell-off.

Figure 2: The Fed Model, 1980 to May 2003
Source: Ziembra (2003)



The third decline is February 27 through April 2007 which is still in progress (VIX-wise) as we write this although the early April S&P 500 is well above its February 27 and March 13 lows of 1399.04 and 1377.95, respectively. For months, there has been talk of the current period being the longest time without a two per cent decline in one day or a large monthly decline. The stock market had low volatility since the 2006 decline; see Figure 3 which plots the VIX for the last five years and the last 17 years.

Figure 3: VIX. Source: yahoo finance**(a) Five year VIX****(b) 17 year VIX**

An example of these sentiments was made by Bob Stovall, a 50-year Wall Street veteran, in a talk on November 15, 2006 to investment students at Stetson University. Stovall argued that given the current real economic growth in 2006, it would be very difficult for stocks in the S&P 500 to continue to increase in price (Moffatt, 2006). Without economic growth, companies would have trouble meeting earnings expectations. He said that the average bull market in US history lasts approximately 56 months. At that time, the US was approaching the 50th month of the bull market. He concluded that a shift toward steady cash flow stocks with dividends was preferable to large capital gains stocks.

On Tuesday, February 27, 2007, the S&P 500

fell 50.33 points or 3.47 per cent to 1399.04. On that drop, the VIX volatility index rose from 11.15 to 18.3one per cent, a jump of 64.22 per cent; see Figure 3. Several concurrent triggers have been mentioned for the fall, which were exacerbated by the confused reaction of market participants to these events. The first was a nine per cent fall in the Shanghai and Shenzhen stock markets, itself triggered by rumors that the Chinese government was going to raise the bank's reserve requirement and make regulatory changes to slow speculative activity in the soaring Chinese equity markets. The Chinese market drop triggered substantial sell-offs in Asia (where most equity markets were near peaks) and Europe as well as in the U.S. While we believe that China is one of the most interesting

financial market to study now, we also feel that this drop is *not* the underlying cause of the S&P persistent weakness. The Shanghai index was up more than 100 per cent in 2006 and way up in early 2007 so the nine per cent fall is a minor blip in the long run growth trend, and likely motivated by profit-taking and a concern about over-valuation. Furthermore, it is not an indication of slowing of the Chinese economy which is expected to grow around nine-ten per cent in 2007. Chinese markets tend to be quite volatile. Several weeks before the February 27 decline, the Shanghai exchange fell one per cent in one week in early February, a decline which received little attention in international markets because it was spread over a week (Vincent, 2007). These two declines were the greatest since February 1997, when news of Deng Xiaoping's ill health triggered a sell-off. Thus, the Chinese decline may have determined the timing of the global equity decline, and return of increasing volatility and risk aversion but is not the underlying cause. Indeed in early April 2007 the Chinese market indices rose to new highs well above the February 25 interim high.

We expect that just like Japan, whose Nikkei stock average rose 221 times in yen and 550 times in US dollars from 1948 to 1988, but with 20 declines of ten per cent+, China will likely have higher gains in dollars than RMB, be overpriced like Japan, propelled up by fast growth and low interest rates and high liquidity and still experience many corrections. See Ziemba and Schwartz (1991, 1992) and Stone and Ziemba (1993) regarding Japan. But the *market* did not understand this. Rather many market actors tend to react as a herd to such events, seeking to minimize their losses, but the more recent response appears to be buy on dips. See our primer on Chinese investment markets below for more description of Chinese markets

Other news also contributed to the fall in the S&P 500 and worldwide markets Tuesday included a statement by former Fed Chair Alan Greenspan that a recession in the US was a possibility although it was not probable as well as some weak economic numbers.

Greenspan later said the probability of a recession was 25 per cent. At the time, bond prices were actually estimating a higher probability. We assume, that even though it might be wise for a

former Fed chair to let the current Fed chair do the talking, audiences like the one in Hong Kong, require that Greenspan say something interesting to earn his \$150,000 speaking fee.

The decline was exacerbated by a large unwinding of yen carry trades who sold stock and created a short covering rally in the yen that moved the USD/JPY exchange rate from 127 to 116; see Figure 4. on the yen dollar rate from March 30, 2006 to March 30, 2007. However, it appears that those who foresaw the end of the yen carry trade spoke too soon. Although the Bank of Japan recently doubled interest rates (in February 2007), the benchmark rate of 0.5 per cent remains far below other interest rates - encouraging Japanese retail and institutional investors to continue to seek higher returns abroad, and foreign investors to use the weak yen as a financing currency - even if Morgan Stanley recently argued that yen-denominated loans to retail investors remain very small (Morgan Stanley 2007)

Accentuating the tension were political as well as economic risks. Many commentators such as Lawrence Summers (former Treasury Secretary and Harvard President and current DE Shaw hedge fund consultant) have argued that the market was not pricing in the worldwide risks in most assets including the S&P 500. However, both of WTZ's large crash ten per cent+ measures were not in the danger zone. The decline in February 27 to early April, and possibly beyond, had not

reached a ten per cent fall and the VIX which reached 19 per cent was bouncing around the 13-16 per cent range most of the time.

We turn to the Eurasia group's list of top seven political risks for 2007 for an assessment of some of the geopolitical risks and their possible effect on the global economy. The risks as reported by Ian Bremmer are as follows: (Bremmer, 2007)

- Iran
- Nigeria
- Iraq
- Turkey
- Russia
- China
- Afghanistan/Pakistan

The majority of these risks are challenges of political transition and succession that could impact energy supply (Russia, Nigeria, Iran), regional power plays in the Middle East (Iran, Iraq, Turkey), the war on terror (Afghanistan/Pakistan, Iraq) or involve challengers to US dominance in the global politics and economy (Chinese succession, Russia).

The top risk, how to respond to Iran's nuclear ambitions and the potential impact of a military escalation on asset prices, has regained increasing urgency in recent weeks, following the March 23, 2007 Iranian capture of British hostages. Oil prices rose after their escalation of the Iran crisis has again lifted oil prices, which were slow to fall considerably. Although the US does not import oil

from Iran and the majority of its energy imports originate from Canada and Mexico, Iran exports significant oil to American allies in Asia and has the potential to block oil from the southern shore of the gulf. Furthermore, even though the hostages were released, the crisis raised a series of questions about Iran's nuclear program, influence in Iraq and the role of the US-UK alliance.

The Eurasia Group also isolated four longer term risks that will challenge policy makers and investors for years to come: pandemic influenza, terrorism, resource nationalization, and protectionism. Many of these longer-term risks are present in their 2007 issues to watch. See their February 2, 2007 report on these longer term risks.

Rumors are moving these nervous markets. The rumor that failed Amaranth trader Brian Hunter (see Herbst-Baylis, 2007 and others) was going to manage a commodities volatility fund in a new series of funds for Solego Capital of Calgary, Alberta and Greenwich, Connecticut, moved the natural gas and related calendar spread trades in the direction Hunter is known to favor. That is, higher winter and lower summers. Amaranth collapsed because Hunter greatly overbet and his weather forecasts turned out to be wrong and he foolishly doubled his position. The March 28, 2007 rumor of an Iran attack on a US warship moved the dollar and oil prices. This rumor caused oil to spike to \$5 to \$68 and then fall quickly to \$64.  and global markets are very reactive to any negative news about the US economy and the fears that it might spark a global slowdown. Other fears include the fallout of subprime housing loan defaults and its effect on consumer credit and the drop in consumer confidence which fell from 111.2 in February to 107.2 in March and declining housing sales, starts and prices. WTZ will stick to his two crash measures and Buffett's measure of the ratio of stock value to GDP for the big crashes but nervousness can easily drop prices in the short-term and investors need to be hedged against such reversals and have plenty of cash available to weather such storms. Also the S&P 500 earnings are projected to rise only 3.8 per cent following 4Q2006, the first below ten per cent rise since 2003; and only 6.7 per cent in 2007 versus 16 per cent in 2006.

We close this column with some background on Chinese investment markets. Given that China's growth, demand for commodities will continue to influence global asset prices

A primer on Chinese investment markets

Investing in China requires a leap of faith

The cycles will be much wider and more frequent in

Figure 4: Daily yen, one year from March 30, 2006 to March 30, 2007

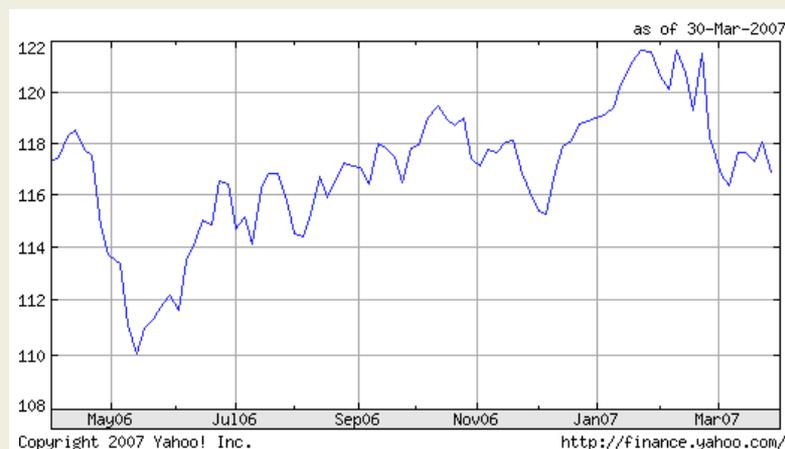
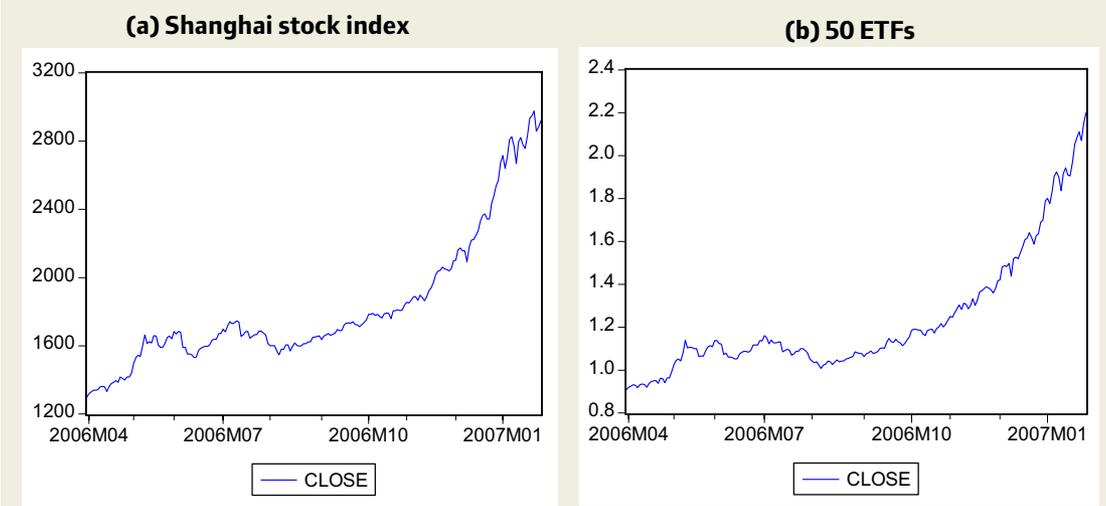


Figure 5: Chinese stock markets, 2006-3-31 to 2007-1-28. Source: Ruoan (2007)



China because of the lack of information. Having said that, if you're investing, you should put a fairly large part of your total assets in China because within as short a period as 30 years, China is likely to have the largest gross national product any nation has ever had.

John Templeton, April 1, 2004 in *Smart Money*

Opportunities for private Chinese and foreign investors are expanding, making it more critical to assess what makes for a good investment. The critical issues to consider are past good investments and determining what looks good for the future, including broader global trends that affect and are affected by policies in China.

Other limits to investment include ownership regulations, e.g., what items can be bought by

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foreigners especially related to stock issues and types and nature of joint ventures. The government still owns all the land so property is leased, though the most recent party conference approved changes which would recognize some private property. With a shortage of apartments and a continuing move to urban areas, there is

constant upward pressure on housing prices. Higher interest rates (though current rates remain low in real terms) and a slowdown poses the greatest danger to investment.

There are several options for foreigners who would like to directly or indirectly invest in China; any of these options would require in-depth research to maximize the investment. Indirect investment includes investing in China-related stocks, companies that do business with China and/or will profit from China's long term economic growth. There are many companies that would fit that description. Natural resource companies, or producers of raw materials or other intermediate inputs for Chinese goods, including energy, agriculture, minerals and parts. Other alterna-

tives include investing in China-related funds, which include mutual funds, closed-end funds, hedge funds and/or offshore funds, focusing on China. There are new funds opening daily. There are still many opportunities in China, but savvy investors will have to do their research to mitigate the asymmetry of information and be sure that

each investment is sound.

Of course, risks remain: country risk factors in China and abroad (political instability, interest rates, changing regulations), which could negatively impact the value of the companies. In addition, investors must prepare for currency risk between the country of investment and their home countries since depreciation of the currency may decrease returns. Fluctuation in resource prices is another source of uncertainty. To take advantage, one might invest in countries that are politically stable, economically open, and that have a currency appreciation prospect (or at least are likely to remain stable), or else to hedge against the potential risk factors involved.

It is difficult to assess the information regarding the Chinese markets. John Templeton about sums it up, we don't really know exactly the returns expected, or in what sectors they are most likely to come but we are convinced that being invested in the long haul is important. This was essentially the same feeling expressed by Jim Rogers in his books *Adventure Capitalist* (2003) and *Hot Commodities* (2005). He mentions buying B-shares when they fell out of favor following the 1997 Asian crash and he expects to just hold on for the long term. However, his advice is not to invest indiscriminately but to do as much research as possible on investments - a policy he follows all over the world. He is convinced in China's importance enough to expect his young daughter will learn Mandarin and he recently announced a move to China! It is clear that China will become an even more important player in the world economy and political arena.

China's financial markets are dynamic. Recently there have been a growing number of initial public offerings, which have been oversubscribed. The largest of these was the ICBC IPO in 2006, which has since become the third largest global bank, and who recently reported the highest earnings in 2006 (Bloomberg). At the same time listed companies have increased in number and in quality, contributing to better performing indices. This has coincided with increased demand from Chinese investors and massive loan and credit growth.

Part of the high demand for Chinese stocks is explained by the relative lack of investment vehicles for domestic investors along with pent-up

demand from foreign investors, very few of whom are currently eligible to invest in the Chinese equity markets. The Chinese financial sector remains quite underdeveloped for its market capitalization. although the extreme liquidity in China and the global economy provides ample (perhaps too ample) financing, the corporate bond market is very small, with most companies receiving funds from government banks whose financing decisions may be more political and based on business plans. (Gale, 2007).

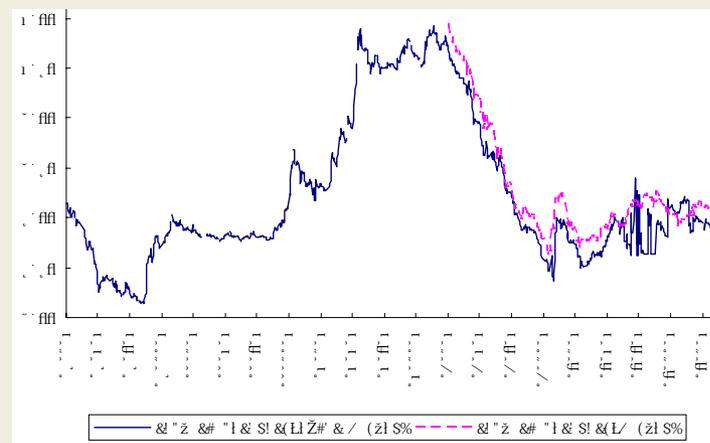
High earners propelled the Shanghai and Shenzhen stock markets up by 140 per cent from February 2006 to the end of January 2007. See Figure 5. The public is very active in buying mutual funds and is redeploying savings account money into what they hope will be higher yielding equities. The lack of capital gains tax added fuel to the rally. The introduction of the qualified foreign investor program as discussed above has eased the way for some foreign investors, and added slightly to the liquidity of the exchange, but only a small proportion of investors have such access. One of the triggers for the stock rally on February 28, the day after the sell-off, was an announcement that the government would increase the proportion such investors could purchase.

Across China, tales of riches are captivating the country and enticing millions. Investors opened an estimated 50,000 retail brokerage accounts a day in December. A new mutual fund from a Beijing-based money manager partly owned by Germany's Deutsche Bank AG raised the equivalent of \$5.1 billion in its December launch, a new record.

Measured by the price earnings ratios, the valuations are not cheap and are well above those in most other countries. The end of December 2006 PE ratios on the Shanghai stock exchange were 37.57 for the Chinese traded A-shares and 28.15 for the hard currency B-shares traded by foreigners. The Shenzhen stock exchange had a similar PE ratio for the A-shares (37.46) but the B shares were lower at 23.2.

The B-share market is still small and illiquid with an average daily volume in 2006 of about US\$65 million. Its purpose to provide foreign

Figure 6: Long bond yield to maturity of Treasury bonds in Shanghai stock exchange, 2002-3-31 to 2007-1-28.
Source: Ruoan (2007)



investors with access to Chinese equities was usurped by the Hong Kong H-shares which have a market capitalization of over US\$800 billion versus US\$19 billion for the B-shares. Rumors suggest that the B-shares might be merged with the A-shares. As of December 2006, there were 109 listed B-shares of which 85 also have yuan-denominated A-shares. Since the A-shares trade at a discount of about 30 per cent, they could be bought back. But Chinese

Table 2: Large declines in the Shanghai stock exchange. Source: Burton (2007)

1995-05-23	-16.39	1997-05-22	-8.83
1993-12-20	-13.08	1992-12-26	-8.46
1994-08-09	-12.67	1994-07-28	-8.43
1993-03-22	-11.75	1998-08-17	-8.36
1992-10-27	-11.18	1992-05-27	-8.31
1994-10-05	-10.71	1993-05-04	-8.21
1994-10-13	-10.64	1994-09-29	-8.00
1993-03-01	-10.46	1992-10-22	-7.84
1992-08-11	-10.44	1994-10-26	-7.82
1992-05-24	-10.30	1996-04-30	-7.78
1992-12-09	-10.28	1999-07-01	-7.61
1996-12-16	-9.91	1992-12-10	-7.57
1992-08-12	-9.52	1993-02-24	-7.49
1996-12-17	-9.44	1996-11-21	-7.31
1992-10-26	-9.43	1994-09-07	-7.30
1992-09-08	-8.92	-	-
1997-02-18	-8.91	2007-01-25	-3.96

companies historically prefer to invest in growth opportunities rather than in buy-backs. Moreover, they would have to raise cash on the A-share market in competition with other companies trying to expand. The conversion from B's to A's would require compensation, another undesirable.

However, continuing growth does make some of these equities vulnerable. As of January 2007, there were increasing fears that the stock markets might be overvalued - and markets likely to be volatile. As any conversion of B's to A's could be complex, it may not occur.

Figure 6. shows the long bond (5-year) Treasury bond rates on the Shanghai stock exchange from 2002 to early 2007. Since

these rates are currently about 2.9 per cent, the bond-stock model is not in the danger zone in China despite these high PE ratios. But the trend of Chinese interest rates is higher so the situation must be watched carefully. The measure is about , which is below the danger level. Since Chinese interest rates have historically been below those in the US, the danger zone is well below the about three per cent long bond minus stock earnings yield danger level for the US.

China is now more comparable to Japan in the early 1980s rather than the US. In Japan from 1948 to 1988, the stock market rose 221 times in yen and 550 times in dollars, yet had 20 declines of ten per cent or more; see Ziemba and Schwartz (1991). Historically, the Shanghai market has had many large declines with daily changes as high as the on 23 May 1995. The 50 best and largest listed companies had a dramatic rise of over 40 per cent in late December 2006 to end January 2007 with a 3.9 per cent fall on 25 January 2006. See Figure 5 and Table 2. as described above. So with growth rates more than ten per cent and a wide and growing trade surplus and a world awash in liquidity, the Chinese markets may well mirror Japan in the 1980s with a large but bumpy ride up to higher levels. Eventually there will be movement towards the Hong Kong H share level, see Figure 7.

In 1988-89 at the peak, Japan had PE ratios in the range of 60 until the interest rates rose in mid 1989 into August 1990 to crash the market; see

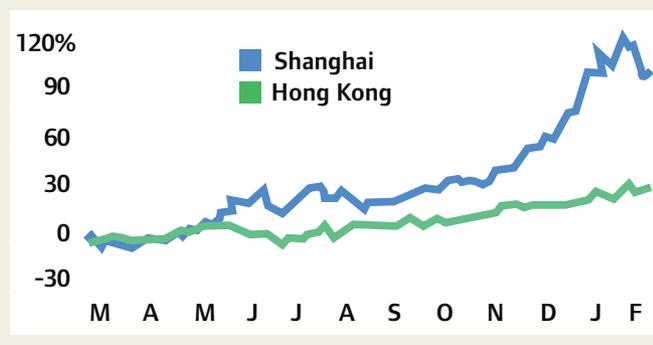
Ziemba and Schwartz (1991).

According to calculations by Professor Ren Ruoan of Beihang University, Beijing, there is price parity at an exchange rate of about five yuan per dollar. So the slight drift upward in the yuan of seven per cent that we have seen from July 2005 to March 2007 might bring the yuan to this level in about ten years, however it is possible that officials may speed this process.

The *nationalization* of global financial flows evidenced by the increase of Asian reserves to sterilize inflows and due to the large trade and current account surpluses of many Asian countries (as well as the willingness of Asian countries to buy U.S. assets) has created a huge liquidity problem which so far has resulted in concentration of assets in low yielding treasuries. A number of countries manage their exchange rates and therefore must hold on to growing reserves as they attempt to neutralize inflows; this concentration helps to explain the conundrum of the insatiable demand for bonds, even at very low yields and the lack of demand for equities, even at low valuations.

So far, China's reserves, growing by nearly \$200 billion a year, have been managed by the State Administration for Foreign Exchange, a department of the central bank, and invested almost entirely in government bonds and other low-yielding presumably risk-free assets. (See Setser and Rosenblatt, 2006, for more details on the composition and growth of China's reserve assets.) Recently China announced a new department, the State Foreign Exchange Investment Corporation, which will manage a portion of its more than \$1 trillion of foreign exchange reserves more actively. This agency will be led by a former Finance Ministry vice chair, with representation from the central bank and report to the State Council. Its mandate is to diversify into various assets including non-Chinese equities, property and direct investments abroad. Initial estimates indicate that \$200-250 billion will be available for such investment, financed through the sale of RMB bonds which will have the dual role of soaking up liquidity. This policy change in China, while still concentrating assets in the hands of the government, will likely generate a major change in global markets,

Figure 7: The Shanghai A price index vs the Hong Kong H index, May 2006 to February 9, 2007



including the relative valuations of bonds and equities and other asset classes, including possibly energy and metals.

As we go to press, the Bush administration has for the first time in many years imposed a counter-

vailing duty on imported paper from China, the first time in 23 years that the US has imposed such duties in response to subsidies of a non-market economy. See Ziemba and Schwartz (1992) for an economic analysis suggesting that if the Chinese impose the tariffs on exports or impose quotas they could better gain the economic rent, but if the US does, then they give the money to them. This action spells trouble on the horizon, but is a reflection of the growing U.S. political pressure and concern about the size of the U.S. trade deficit with China and the range of tools with which U.S. policymakers will employ. As such, such actions may have significant impacts on U.S. assets and U.S. and Chinese equity markets. This could include dollar declines and interest rate rises to maintain capital inflows.

FOOTNOTE AND REFERENCES

1 <http://www.harvardmagazine.com/on-line/110665.html>
There have been additional small corrections including several 6-9 per cent declines from July to September 2004 and March to June 2005. In an April 9 2007 Barron's article, Michael Santoli notes that there has been one such pullback each year since 2004. In each case, a recovery quickly followed each decline and each retreat has been shallower than the preceding one and a faster recovery of the loss. Buying on the declines has been rewarded as bidders try to beat the crowd and speed up the recovery. Buying on these dips has worked so far, as has selling put options during the greatly expanded volatility which returned to low levels after the decline. There is evidence that the current decline is following this pattern. As of April 6 2007, the futures market returned to pre-decline levels with the VIX at 13.23, so this 2007 decline may well be nearly over.
In Japan's early development period, foreign exchange reserves were controlled by the MITI. These were given out to support development of the economy. Soon firms were able to hold onto their foreign earnings and reinvest them according to their own plans. We know that some of these were spent on trophy purchases; see Ziemba and Schwartz, 1992.

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