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NIXING THE VIX: VOLATILITY RETURNS

As several equity indexes (e.g., the Dow Jones Industrial Average and the S&P 500) hit all-time highs recently, investors also noticed that stocks seem volatile, at least compared to earlier in 2007. In fact, investors are right. Equity returns, as well as bond returns, have gone up and down more in the past couple of months than for many months previously.

- Is it true that markets have been particularly volatile?
- How can we think about future market volatility?
- What is the VIX, or the volatility index?

Let's start with the VIX, which is otherwise known as the S&P 500 Volatility Index. It is also sometimes known as the "Fear Index," or how much volatility options investors expect to see in the market over the next 30 days. The VIX was originally conceived by Duke Professor Robert E. Whaley in 1993 and was introduced shortly thereafter. The VIX is calculated, disseminated, and maintained by the Chicago Board Options Exchange (CBOE), where over 450 million options contracts are traded each year covering individual stocks, about 50 stock indexes, and 50 ETF (exchange traded funds).

The VIX is a measure of a weighted blend of prices for options on the S&P 500 Index. These options are all out-of-the-money puts and calls, which means that they are options that, if they expire at the current index price, will be unlikely to be exercised by the purchaser. For example, let's say that the purchaser of a put option has bought the right to sell the S&P 500 index at a certain price at some



date in the future. If the S&P's value is above the agreed-upon price on the expiration date, then the purchaser is unlikely to want to complete the deal, so the option is allowed to expire. Similarly, the purchaser of a call option (the right to buy a certain amount of the S&P 500 index at a certain price on a certain date) would probably not want to complete the transaction if the S&P's value dropped below the contract price on the expiration date.

Using options that are currently out-of-the-money for the next month's as well as the following month's expiration dates, the CBOE estimates the implied volatility for a synthetic, at-the-money S&P 500 option, with 30 days before it would hypothetically expire. This estimate is calculated constantly so that implied or expected volatility can be observed

throughout the CBOE trading day. Moreover, the CBOE has also create VIX futures and exchange-listed options, so that investors can trade the volatility itself.

How might the VIX help investors? One way is to show, from the actual behavior of options traders, what the options market may be saying about stock volatility in the near future. For example, if we turn to the first exhibit, we can see the behavior of the VIX from the beginning of 1990 to 2007. The vertical axis is a measure of implied volatility on an annualized basis. So a VIX of 15 implies that the stock market could move up or down 15% on an annualized basis, or 4.33% over the next month (that is 15% divided by the square root of 12 in order to obtain the monthly projection). Note that the VIX doesn't contain any information about

EXHIBIT 1: S&P 500 VIX (VOLATILITY INDEX) JANUARY 1990 – SEPTEMBER 2007

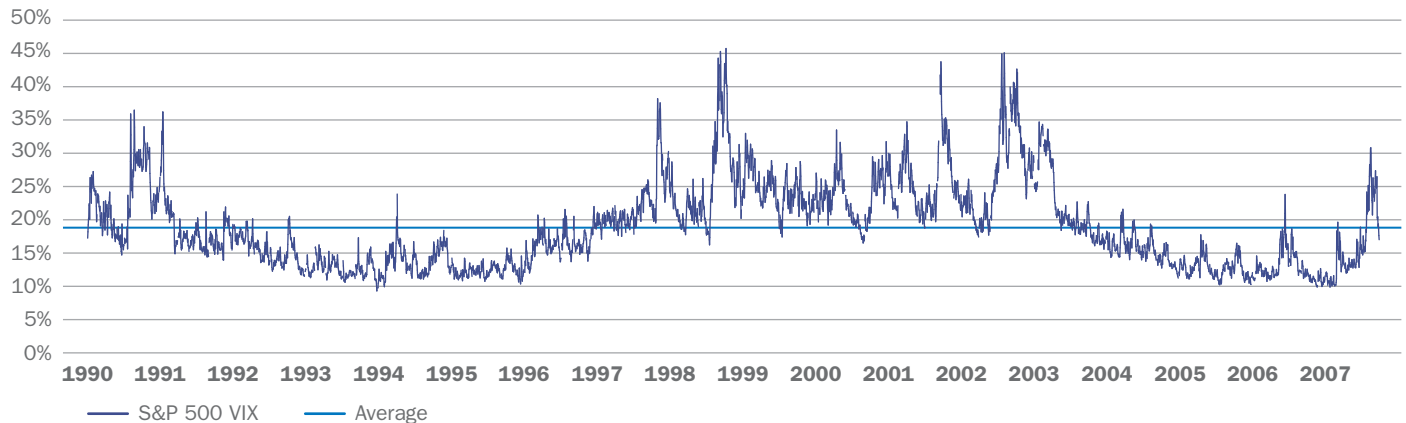
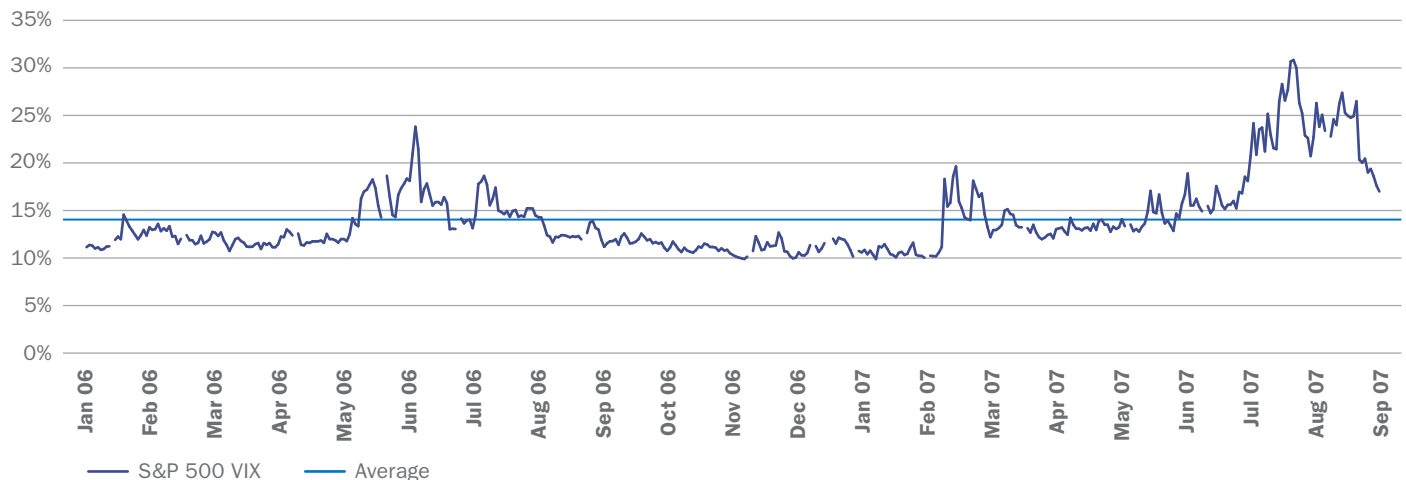


EXHIBIT 2: S&P 500 VIX (VOLATILITY INDEX) JANUARY 2006 – SEPTEMBER 2007



which direction the market will move, only that it could move the implied percentage.

From the first exhibit, we can see that implied volatility has average about 18.5% since 1990. During the late 1990s through 2003, the VIX was considerably higher than the long-term average, hitting 45% twice. Since 2003 the index has been mostly below average, implying a period of very low stock volatility. It is only in the past few months that the volatility index has risen above the average, corresponding to the actual volatility that has been experienced by equity investors during that time.

In fact, if we turn to the second exhibit, we can see that, with the exception of March, implied volatility was below the short-term average (2006–2007) for the first half of 2007. The only exception, in March, presaged the increase in actual market volatility in April that was triggered by a meltdown in the Shanghai stock exchange. In the latter half of June implied volatility began increasing again and peaked in the middle of September. It fell from 26% on the 17th of September to 17% on the last trading day of September. So the implied volatility index seemed to anticipate the volatile markets experienced in August and September due largely to the recognition of sub-prime mortgage market problems. If the VIX is correct, we should be settling into a period of lower volatility for the next month or perhaps longer.

There are some cautions to carry with you in thinking about the VIX and the actual stock market. First, the VIX is

several steps removed, not only from the actual S&P 500, but especially from the actual behavior of any individual stock. Actual stocks and indexes could behave differently from the implied volatility index. Further, as we mentioned, the VIX is an estimate of future volatility, or how much the market might bounce around, but not actual returns, which could go up or down.

Still, the VIX is an interesting and helpful measure of short-term future volatility that can help investors gauge not only where the volatility of the market may go but, looking back, where it has been. As we have seen, recent implied market volatility is nowhere near previous peaks. It seems that the VIX is nearer its short-term and long-term averages than it is to the peak.

How should an investor use the VIX? One way is to understand that markets tend to, but not always, be more volatile when stocks are falling than when stocks are rising. So a big spike in implied volatility has often come just before a market downturn. This finding should be interpreted cautiously, since as the first exhibit shows, implied volatility was very high at two points during 1998, even though the market kept rising rapidly until 2000. During 1998, the Russian bond meltdown affected markets worldwide and the Fed lowered short-term rates significantly, thus stimulating the stock market. Nevertheless, an investor can use the VIX to think about future market risk and what an increase in volatility might indicate about the potential for a downturn.

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