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Some Observations About Japan's Zero Interest Rate Policy and the Yen Carry Trade

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Submitted to the Program of Organizational Dynamics in the Graduate Division of the School of Arts and Sciences in Partial Fulfillment of the Requirements for the Degree of Master of Philosophy at the University of Pennsylvania. Advisor: Dr. Peter Steiner

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Some Observations About Japan's Zero Interest Rate Policy and the Yen Carry Trade

Abstract
This thesis discusses the evolution of the Japanese Monetary Policy and its relationship to the Yen carry trade. I track this development from inception. I specifically examine how the central Bank of Japan (BOJ) is proceeding now to withdraw Japan from the zero interest rate policy. Specifically covered are the last two years in which central bank policy changed from quantitative easing to interest rate targeting. I present evidence to show how Japan's zero interest rate policy and the evolution of Yen carry trade activity coincided with a reduction in risk premiums throughout the world. I also show how the withdrawal of the Yen carry trade had a temporary impact on those risk premiums in May and June of 2006 and January and February of 2007. Estimates of the size of financial markets impacts are included.

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SOME OBSERVATIONS ABOUT JAPAN'S ZERO INTEREST RATE POLICY AND THE YEN CARRY TRADE

By

David R. Kotok

Submitted to the Program of Organizational Dynamics
in the Graduate Division of the School of Arts and Sciences
in Partial Fulfillment of the Requirements for the Degree of
Master of Philosophy at the
University of Pennsylvania

Philadelphia, Pennsylvania

2007

SOME OBSERVATIONS ABOUT JAPAN'S ZERO INTEREST RATE POLICY AND

THE YEN CARRY TRADE

Approved by:

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Larry M. Starr, Ph.D., Program Director

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Peter Steiner, Ph.D., Advisor

ABSTRACT

This thesis discusses the evolution of the Japanese Monetary Policy and its relationship to the Yen carry trade. I track this development from inception. I specifically examine how the central Bank of Japan (BOJ) is proceeding now to withdraw Japan from the zero interest rate policy. Specifically covered are the last two years in which central bank policy changed from quantitative easing to interest rate targeting. I present evidence to show how Japan's zero interest rate policy and the evolution of Yen carry trade activity coincided with a reduction in risk premiums throughout the world. I also show how the withdrawal of the Yen carry trade had a temporary impact on those risk premiums in May and June of 2006 and January and February of 2007. Estimates of the size of financial markets impacts are included.

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CHAPTER 1

INTRODUCTION

During the 1990s while most of the world's economies were growing, Japan experienced a prolonged and consistent period of deflation. Economic policies by the government of Japan and the Bank of Japan (BOJ) included a continued reduction of interest rates.[1]

The rest of the world experienced inflation albeit at a low level.[2] Japan was the only G-7 (Group of Seven) [3] country to have persistent deflation. During the decade of the 1990s it averaged about 1 percent per year.[4] The inflation average of the G-7 countries was a positive 1 ½ percent per year. The six (ex-Japan) other G-7 countries were all positive. The average of the seven countries was brought down to 1 ½ percent per year by the negative rate of inflation (deflation) in Japan.

As the decade of the 1990s gave way to the first decade of the new millennium, Japan's trend of deflation worsened. Computations for the period of 2000 to 2006 show that the average deflation rate in Japan started to exceed 1 percent per year. This occurred while the median of standard deviation of trends, otherwise known as the measure of the variances of those trends, remained constant among the G-7 countries. Statistical evidence computed for the Monetary Policy Forum in 2007 demonstrates how

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[1] Data is from the Bank of Japan (English translation website); minutes of various meetings from 1996-2007.

[2] Stephen G. Cecchetti, Peter Hooper, Bruce C. Kasman, Kermit L. Schoenholtz and Mark W. Watson, U.S. Monetary Policy Forum 2007, Understanding the Evolving Inflation Process, February 2007, page 14.

[3] The Group of Seven countries (G-7) are Canada, France, Germany, Italy, Japan, United Kingdom, and the United States.

[4] Cecchetti, et al., loc. cit.

Japan's deflation rate was worsening while the average variance among the G-7 countries was constant. Clearly, Japan faced an extraordinary situation.

On March 19, 2001, the Bank of Japan announced "new procedures for money market operations and monetary easing."[5] The Bank of Japan had already reduced its interest rate to zero using classic interest rate targeting. Now they were attempting to add "quantitative easing"[6] as an additional technique in order to force liquidity into the marketplace and attempt to arrest the accelerating deflationary trend. The BOJ initiated its first quantitative easing procedure following the announcement of its March 19, 2001 change and subsequently issued a procedural manual indicating how it would attempt to add additional reserves in its operations.

The BOJ continued its policy indicating that this was an alteration of the zero interest rate policy that had previously existed in Japan. Essentially, Japan engaged in rapid expansion of money using the electronic equivalent of the printing press. Initial tranches raised the current balances to five trillion Yen. The BOJ announced that they would accelerate the growth rate of their monetary base.

During that period from March 19, 2001 through March 9, 2006, the BOJ maintained its policy of quantitative easing. Trillions of Yen were monetized, created and injected into world reserves. The policy setting interest rate of the BOJ was maintained at zero. Statements from the BOJ continued to reaffirm quantitative easing as a strategy in concert with a zero interest rate policy.[7]

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[5] Data is from Bank of Japan (English translation website); minutes of the Monetary Policy Committee, March 19, 2001, page 1.

[6] Mark M. Spiegel, FRBSF (Federal Reserve Bank of San Francisco) Economic Letter Number 2006-28, October 20, 2006, page 1.

[7] See Bank of Japan website (www.boj.or.jp/en).

This initial BOJ target was raised nine additional times between March 2001 and December 2004 and eventually reached 35 trillion Yen.[8] The BOJ implemented that policy by buying Japanese government securities principally the 10-year government bond in order to inject those reserves. The effect was to reduce interest rates in the bond market Japan. At one point this benchmark interest rate reached a low of approximately ½ of 1 percent per year.[9]

The persistent use of quantitative easing by the BOJ and the continual statements coming from the BOJ led global financial markets to believe that a zero interest rate policy would be maintained for a prolonged period of time. Market expectations were altered by this policy initiative. Clearly market expectations about interest rates and inflation rates are critical to financial market activities.[10] Economic literature is replete with discussions of market expectations and how they are the drivers of policy.

Debate continues on whether the policy of quantitative easing worked to turn the Japanese economy from its deflationary trend because of this quantitative easing policy. There are some indications that the banking system of Japan profited because of this form of monetary subsidy. This enabled the Japanese banking system to survive without forced liquidations and bankruptcies.[11]

Another way to measure success of this policy is to compare growth rates among the G-7 countries. Cecchetti, et al., found that the "median standard deviation of the growth across decades"[12] declined in six of the G-7 countries during the last two decades

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[8] Spiegel, loc. cit.
[9] Source is Bloomberg data base.
[10] See The Federal Reserve Board, Remarks by Federal Reserve Governor Randall S. Krosner, March 12, 2007.
[11] Spiegel, loc. cit.
[12] Cecchetti, et al., op. cit., p. 21.

of the 1990s and the beginning of the new millennium. "The notable exception" was Japan where the decline was quite small.[13] Whether or not the modest decline in Japan and the Japanese exception to the other G-7 countries was due to quantitative easing or other factors is a subject of debate among economists. The coincidence of events suggests that quantitative easing by the BOJ had some influence on the Japanese banking system and on Japanese policy.

[13] Ibid.

CHAPTER 2

THE EVOLUTION OF THE YEN CARRY TRADE

In its simplest form, the Yen carry trade describes an investment strategy. "An investor borrows a given amount in a low-interest-rate currency" (the funding currency) and converts the money funds into a high interest rate currency (the target currency) and lends the resulting amount in the target currency at a higher interest rate.[14] In theory, such transactions should not be profitable because the investor takes on currency risk; the currency markets know it and adjust accordingly. Under normal circumstances there is a classic economic expectation that the differential in interest rates between the two currencies is offset by the futures pricing of those currencies in the derivative or forward markets. San Francisco Federal Reserve Bank economist, Michelle Cavallo describes this version as the way in which markets "exploit the forward premium of one currency relative to another."[15]

The strategy involved in forward premiums is to sell the currencies for which the forward exchange rate is higher than the spot market exchange rate and buy the currency for which the forward exchange rate is lower than the spot exchange rate. This use of the derivatives market is an alternate form to direct borrowing. Currencies that are at a forward premium are like the funding currencies in the first example and those that are at a forward discount are like the target currencies.[16]

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[14] Michele Cavallo, FRBSF (Federal Reserve Bank of San Francisco) Eonomic Letter Number 2006-31, November 17, 2006, page 1.
[15] Ibid.
[16] Ibid.

A computational example may be helpful. Suppose the Yen is trading at the exchange rate of 121 to the U.S. dollar and the lending rate in borrowing 10 million Yen is 0.5 percent. An individual may borrow 10 million Yen from a Japanese lending institution, convert it to dollars and buy $826,446 worth of U.S. treasury obligations at an interest rate of 5 percent. Note that the interest rate on the U.S. treasury is ten times that of the interest rate on the Japanese loan. In the future, the investor will have to repay the 10 million Yen with interest. Let's assume for this example that the period of time involved is one year. Therefore, the repayment will be 10.5 million Yen since we will assume simple interest of ½ of 1 percent.

In order to obtain the dollars and convert them back to Yen the investor will sell the treasury obligation and receive a 5 percent interest rate for the same period of time. Therefore, the proceeds of the sale of the treasury obligation will be $867,769. If the Yen/dollar exchange rate is 115.81 the investor will have a break even trade. Thus, the investor has taken exchange rate risk on the Yen/dollar currency exchange rate and can calculate it in advance. The investor determines what exchange rate it takes to break even and, therefore, makes a judgment as to whether or not this trade will be profitable.

During the period of quantitative easing, the BOJ continually advised the market that they were going to maintain this policy of very low interest rate. Since their policy interest rate was maintained at zero, Japanese lending institutions could profitably loan money at ½ of 1 percent. They would generate a profit of 50 basis points (a basis point equals 1/100th of 1 percent). Global borrowers could borrow large sums at ½ of 1 percent and buy other securities or make other investments denominated in other currencies than the Japanese Yen.

CHAPTER 3

YEN CARRY TRADE CONTRIBUTED TO THE DECLINE IN GLOBAL RISK PREMIUMS

Risk premiums narrowed throughout the world during the period in which deflation reigned in Japan and the BOJ reduced its interest rates to zero and then commenced the zero interest rate policy and quantitative easing. Various measures of risk premia declined throughout this period, in part, due to the excess liquidity and funding of the Yen carry trade. More and more investors around the world found that they could borrow or use derivatives and forward premium contracts near zero interest rates and invest in other assets globally. Considerable evidence exists that higher yielding currencies like the Australian and New Zealand currencies had huge increases in foreign exchange transactions. Much of that activity is attributable to the Yen carry trade.[17]

Risk premiums can be measured. The 11 charts in the Appendix show the changes in risk premia (1) using interest rates within the United States, (2) different credit categories of bonds, (3) interest rates outside the United States, and (4) measures of credit insurance (credit default swaps).

The evidence seems clear. Global risk premiums continued to narrow throughout the period of March 19, 2001 through March 9, 2006.

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[17] Ibid.

CHAPTER 4

CHANGE IN BANK POLICY AND THE BEGINNING OF THE WITHDRAW OF THE CARRY TRADE

On March 9, 2006 the BOJ announced a "change in the guideline for money market operations."[18] The monetary policy committee of the BOJ altered its view and determined that it would begin to withdraw quantitative easing. That would eliminate the excess balances of Yen that had been created and injected into the system for the previous five years. The BOJ cited their view that "Japan's economy continues to recover steadily."[19] They outlined why they determined that they were going to revert to an interest rate setting policy. They maintained the interest rate at their March meeting at zero.[20] The BOJ commenced withdrawal of excess Yen balances on May 9, 2006 (see charts in Appendix). Those transactions were the first that were visible in financial markets. The result and shock is shown in the charts (see Appendix) in which risk premiums widened abruptly and substantially in response.

Japan was removing, for the first time, the raw material of the zero interest rate policy. Hence, it was making the Yen carry trade less profitable. At the margin, some places in the world were liquidating their Yen carry trade positions. Market transactions for the five weeks from mid-May through mid-June while the Japanese Central Bank engaged in this policy were volatile and substantial.[21]

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[18] See the Bank of Japan, Change in the Guideline for Money Market Operations, minutes of the meeting, March 9, 2006, page 1.
[19] Ibid.
[20] Ibid.
[21] William Pesek Jr., Bloomberg.com, Japan's Boom May Explode Yen – Carry Trade: William Pesek Jr., February 22, 2006.

Stock markets throughout the world lost approximately five trillion dollars in aggregate market value in five weeks.[22] Interest rates rose in all bond markets throughout the world.[23]

We estimate that the change in interest rates caused a decline in value of approximately two trillion U.S. dollars in bond markets. Thus, a total estimate of the first withdrawal of financial transactions in elimination of the Yen carry trade can be estimated. It reduced market values of global stocks and bonds by approximately seven trillion in U.S. dollar terms.

The estimates of the Yen withdrawal vary but center around 70 billion U.S. dollar equivalents.[24] No one knows for sure but an estimate of 70 billion with a market impact of seven trillion approximates a ratio of about 100:1. 100:1 is an expected ratio of the high powered reserve multiplier into financial assets when there are no required currency reserves. For purposes of this discussion we will accept Hale's estimate of 70 billion and the ratio 100:1. It is important to note that the 1 percent or the 100:1 ratio fits a characteristic in which you would include the cost of transactions or other financial frictions. That is why non-fractional reserve additions to the world's financial system do not result in the multiplier number infinity. In theory, without transaction costs or friction, the multiplier of reserves is mathematically infinite.

The BOJ announced their formal change in monetary operations on July 14, 2006. They had implemented the withdrawal of reserves from mid-May to mid-June. They then raised their interest rate from zero to 0.25 percent. That ended the zero interest rate

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[22] Source is World Federation of Stock Exchanges.
[23] Source is Bloomberg data base.
[24] David Hale, August 2006 NBEIC (National Business Economics Issue Council) Quarterly Conference in Green Bay, Wisconsin.

policy that had commenced years before. It also ended quantitative easing which had commenced in March 19, 2001.

The BOJ offered their forecast that the Japanese "economy is likely to expand for a sustained period."[25] In further explanation of their policy change the BOJ said that,

> the Bank has maintained zero interest rates for an extended period, and the stimulus from monetary policy has been gradually amplified against the backdrop of steady improvements in economic activity and prices.[26]

They issued an additional forward looking statement indicating that "today's policy decision will contribute to ensuring price stability and achieving sustainable growth in the medium to long term."[27]

Japan's second interest rate increase occurred in February 2007. During the period from July 14th, 2006 through January 2007, the Bank of Japan continued to maintain an interest rate of 0.25 percent. In its commentary from various meetings and minutes, BOJ officials discussed the very slow policy change pace with which they must normalize the interest rate.

In January 2007, the meeting of the BOJ indicated an interest in raising the interest rate again. At the February meeting in 2007, the BOJ raised the interest rate to 0.5 percent from 0.25 percent. Financial market reaction, again, was volatile. The world's stock markets lost approximately three trillion dollars in market value in the space of about three weeks.[28]

The bond reaction was different. In the bond market, interest rates actually fell. In the prior round, in 2006, interest rates rose when Japan made its first move away from

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25 Bank of Japan, Change in Guideline for Money Market Operations, July 14, 2006, page 1.
26 Ibid., p. 2.
27 Ibid.
28 Source is World Federation Stock Exchange Data.

the zero interest rate policy. An estimate of the increase in market value in bonds (bond prices and values rise when interest rates fall and fall when interest rates rise) using the Bank for International Settlements' aggregate bond data suggests that the world's bond markets increased in market value by approximately one trillion U.S. dollars. Thus, the combined effect of Japan's second interest rate increase was a three trillion dollar deterioration in stock market value and a one trillion dollar improvement in bond market value. This yields a net negative result of approximately two trillion. Various estimates like Bloomberg, Morgan Stanley data base, David Hale and others suggest that the withdrawal of liquidity by the BOJ was approximately 20 billion suggesting that the ratio of 100:1 was maintained.

The quantitative easing measurement was fully reported after March 31, 2007 when the Japanese 2006 fiscal year ended, Market News International said:

> JAPAN: The BOJ's assets decreased sharply to hit the lowest level in seven years at the end of March as the central bank started to depart from a superloose monetary policy, a BOJ report showed Friday, Jiji reports. As of Mar 31 the final day of fiscal 2006, the balance of the bank's assets, including government securities, totaled 112.12 trillion yen, down 32.7 trillion yen, or 22.6 pct, from a year before. The value of annual decline was the largest ever, while the balance was the lowest since 106 trillion yen at the end of fiscal 1999. The decrease in the overall asset balance came as the BOJ siphoned excess liquidity from financial institutions following its departure from the five-year-old quantitative easing policy in March 2006 and from the zero interest rate policy three months later.[29]

The charts (see Appendix) show Japan's interest rate hike 1 and 2 and the result in movement in risk premium measures. Clearly risk premium measures did not deteriorate as rapidly and as extensively in the second Japan interest rate hike period as they did in the first. All measures of risk premiums support this conclusion as the charts (see Appendix) show.

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[29] Market News International, April 6, 2007.

Markets are becoming accustomed to the change in Japanese interest rates as the BOJ returns its policy making to normal. Global investors who are involved in Yen carry trade positions are now able to more easily forecast the results as Japan normalizes policy. Expectations are that the normalization of interest rate policy in Japan will proceed slowly and continue through 2008.[30]

Many observers expect the withdrawal of carry trade to proceed at a slow pace.[31] The BOJ is not about to derail its economic recovery. The policy making in the BOJ includes the Minister of Finance and the Minister of Economic Planning unlike our Federal Reserve System where our U.S. Central Bank acts totally independently. In Japan, two officials from the government sit in the Central Bank meetings. In fact, Article 19 of the BOJ Act allows the Minister of Finance and the Minister of Economic Planning to request a postponement of an interest rate decision until the next meeting. This happened at the January 2007 meeting which is why the interest rate change did not occur until February.

Analysts expect the Yen carry trade to continue at an albeit gradually reducing price. There is no reason to expect it to end abruptly. The gap between Japanese interest rates and the rest of the interest rates in the world still support the profitable notion that borrowing in a currency where the policy interest rate is 0.5 percent and lending in economies where interest rates are higher (5 ¼ percent in the U.S., 5 ¼ percent in the United Kingdom and 3 ¾ percent at the European Central Bank) still maintains a profitable spread. It is important to note that the currency risk in borrowing Japanese

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[30] Pesek, Jr., loc. cit.
[31] Credit Suisse, Global Equity Strategy, February 27, 2007, page 6.

Yen has now risen.[32] For the first time risk premiums are widening in the forward markets in Yen. Investors realize that the BOJ will no longer create huge amounts of excess liquidity in order to maintain a zero interest rate. They are now back to normalizing policy making by targeting interest rates instead of monetary aggregates and quantitative easing.[33]

The Bank of International Settlements estimates that "cross-border Yen borrowing" increased by $161 billion in the two years ending in 2005. Furthermore, they estimate that "$120 billion"[34] of that was channeled through tax haven countries and international financial centers like the Cayman Islands. The Cayman Islands is a place where offshore and unregulated hedge-funds are known to operate in volume.

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32 Pesek, Jr., loc. cit.
33 The Wall Street Journal Online, Understanding the Carry Trade, March 5, 2007, page 1.
34 Ibid.

CONCLUSION

The Yen carry trade evolved out of an attempt by the BOJ to alter monetary policy from focusing on interest rates to implementing quantitative easing. In doing so, the BOJ took the interest rate to zero percent as a policy rate and then injected additional reserves for a continuing and persistent period of time.

The result of those excess reserves was to stimulate borrowing in Yen near a zero percent interest rate and to encourage investing or lending in other currencies and other securities at a higher expected return. For a period of time, global investors were able to do this with near impunity. They continued to see the BOJ persist in the policy of zero interest rates and continued to watch the BOJ officials state that they would not alter this policy for some time.

In 2006, the BOJ altered the policy and gradually started the return to targeting interest rates. They ceased engaging in quantitative easing. The first transaction in May or June 2006 jolted the markets with a high level of volatility and a spike in risk premiums. The results showed global financial markets losing seven trillion U.S. dollar equivalent value in five weeks.

The second Japanese move in interest rates, which raised interest rates from 0.25 to 0.5 percent, had a substantially less impact on world financial markets although the impact was a negative. Global financial markets experienced a value loss of approximately two trillion U.S. dollar equivalents as the process of unwinding Yen carry trade adjusted.

Yen carry trade has been discussed many times in the financial press and in the world. According to Bianco Research, the words "carry trade" spiked to eleven hundred stories a week from practically 20 or 30 stories a week as late as December of last year.[35]

Carry trade now seems to be old news. Markets are aware of its existence and its influence on pricing and on risk premiums and are adjusting accordingly. The BOJ has made known its intention to gradually alter its policy and longer term market projections expect the BOJ to return to normalcy over the next 18 to 24 months.

As markets adjust with a return to normalcy, risk taking also returns. The Gartman Letter in its recent analysis of market conditions offered the following: "the market, for whatever reason seems suddenly willing to take on risk, that only a week ago it was tossing over-board randomly."[36]

Along with projections of a gradual Japanese recovery, albeit at a slow pace, it is expected that exchange rates of Japanese Yen for the U.S. dollar will continue to decline into 2009.[37] Such strengthening of the Japanese Yen against the dollar introduces additional risk to carry trade positions. Remember that a carry trade position is borrowed Yen that is invested in other currencies (like the U.S. dollar). Even though the return in the investment may be higher than the cost of the borrowing, the amounts of currency needed to exchange in order to repay the Yen loan are greater. The adjustment process is no longer done with impunity. It seems that the global subsidy from Japan's zero interest policy is gradually ending.

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[35] Bianco Research, L.L.C., Now What? March 15, 2007 conference call, page 5.
[36] The Gartman Letter L.C., The Yen Is Weak; So Too The Swiss Franc, March 20, 2007, page 1.
[37] Nariman Behravesh, Global Insight, The Global Economy Seems to Have Shrugged Off the U.S. Slowdown: Is This the Beginning of a Multi-Locomotive World?, March 22, 2007, pages 14, 37 and 38.

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APPENDICES

Appendix 1: (Chart 1) Global Bond Risk Premiums are Shrinking, Outside the United States

Appendix 2: (Chart 2) Global Bond Risk Premiums are Shrinking, Outsdie the United States (2006 – Present)

Appendix 3: (Chart 3) Global Bond Risk Premiums are Shrinking, Inside the United States

Appendix 4: (Chart 4) Global Bond Risk Premiums are Shrinking, Inside the United States (2006 – Present)

Appendix 5: (Chart 5) Chicago Board Options Exchange SPX Volatility (VIX) Index

Appendix 6: (Chart 6) Chicago Board Options Exchange SPX Volatility (VIX) Index (2006 – Present)

Appendix 7: (Chart 7) iTraxx: European Corporate Credit Default Swaps (CDS)

Appendix 8: (Chart 8) iTraxx: European Corporate Credit Default Swaps (CDS) - First Japanese Rate Hike, Second Japanese Rate Hike

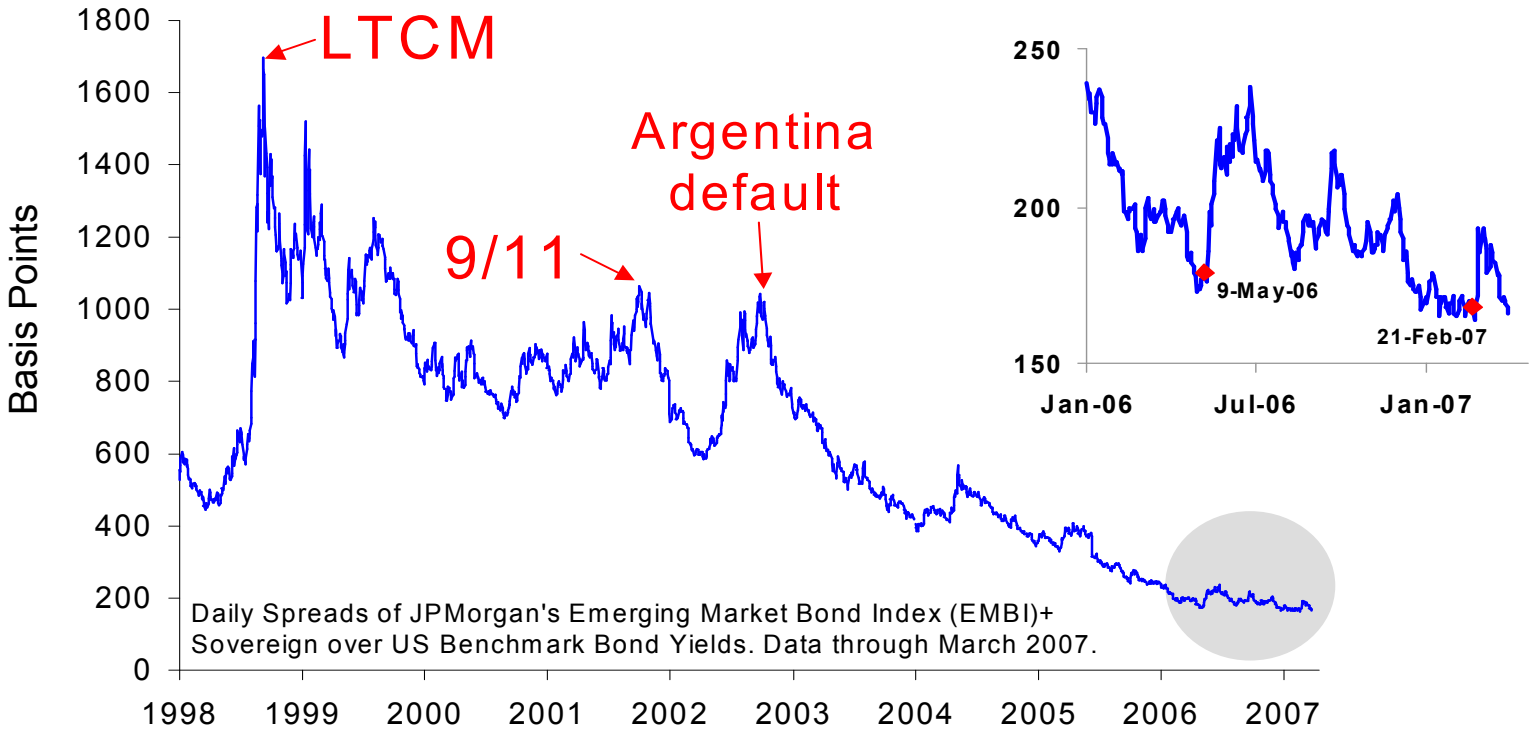
Appendix 9: (Chart 9) Merrill Option Volatility Index (MOVE) – Yield-curve weighted index of the normalized implied volatility on 1-month Treasury options

Appendix 10: (Chart 10) Merrill Option Volatility Index (MOVE) – Yield-curve weighted index of the normalized implied volatility on 1-month Treasury options (2006 – Present)

Appendix 11: (Chart 11) Global Bond Risk Premiums are Shrinking, In the United States

Global Bond Risk Premiums are Shrinking

Outside the United States



Source: JP Morgan and Cumberland Advisors. © Cumberland Advisors

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Chart 1

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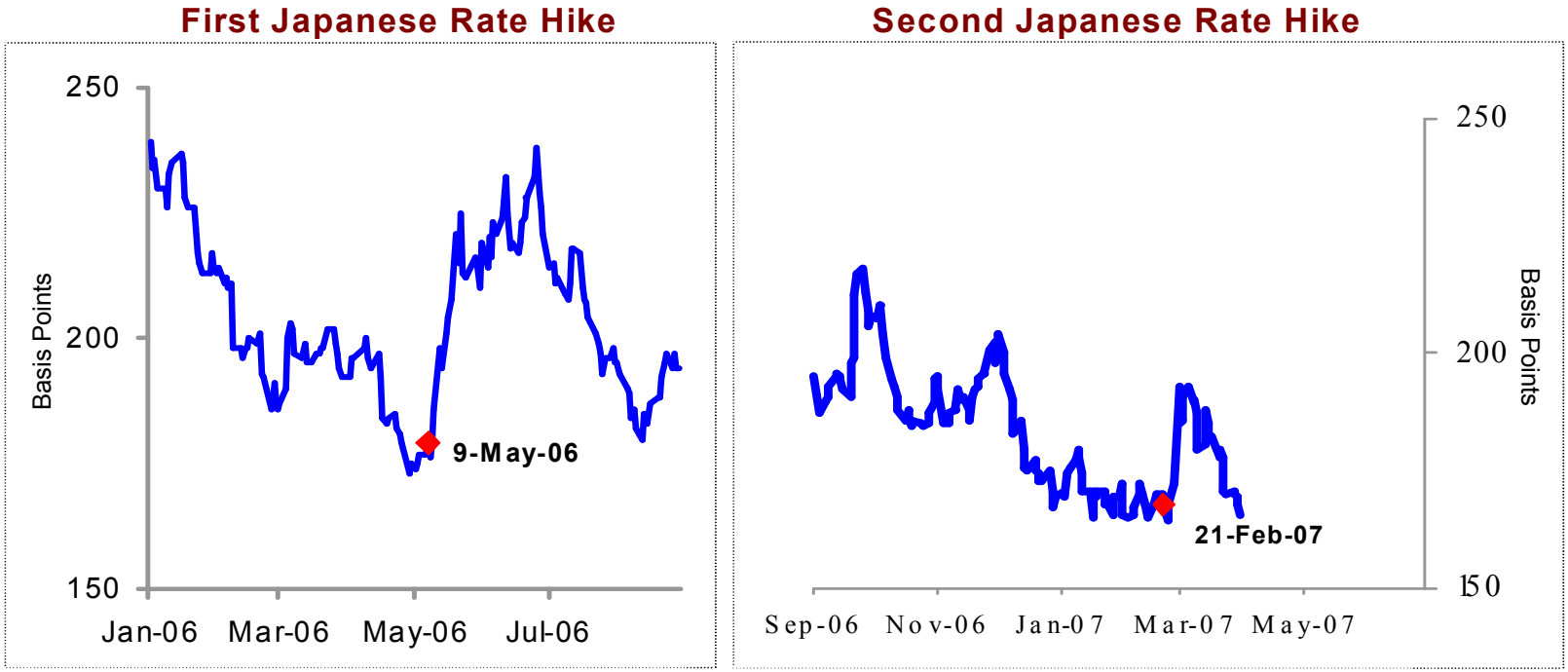
Global Bond Risk Premiums are Shrinking

Outside the United States (2006 – Present)



Daily Spreads of JPMorgan's Emerging Market Bond Index (EMBI)+ Sovereign over US Benchmark Bond Yields.
Data through March 2007. Source: JP Morgan and Cumberland Advisors. © Cumberland Advisors

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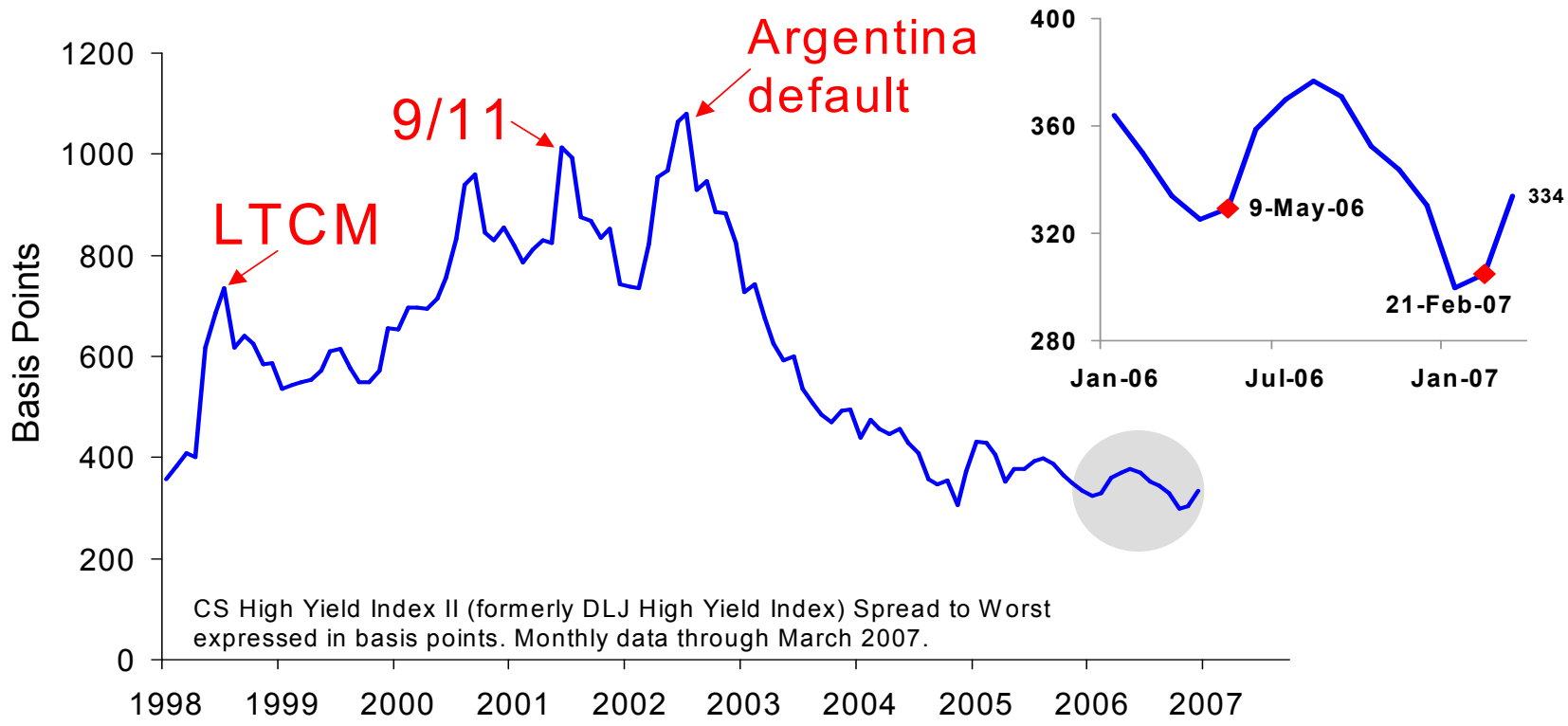
Global Bond Risk Premiums are Shrinking

Inside the United States



Source: Bloomberg and Cumberland Advisors. © Cumberland Advisors

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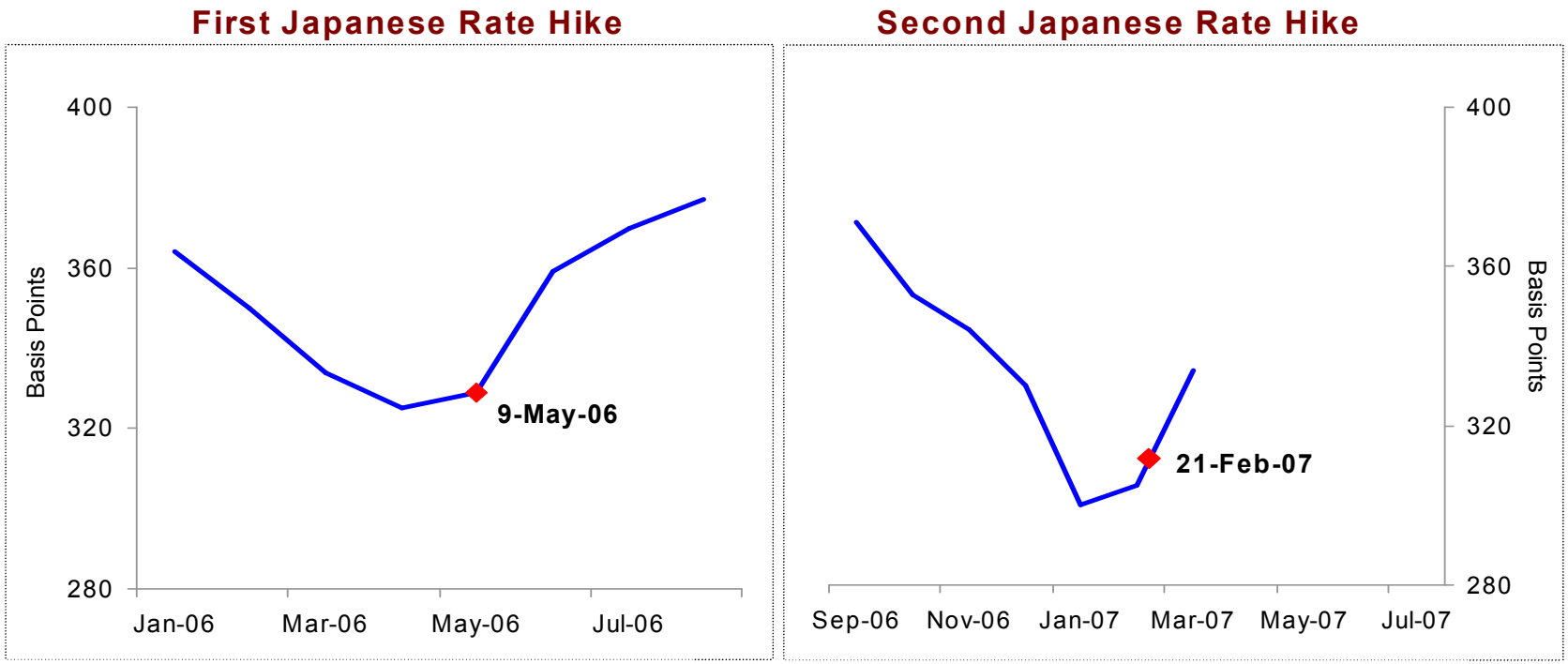
Inside the United States (2006 – Present)



CS High Yield Index II (formerly DLJ High Yield Index) Spread to Worst expressed in basis points. Monthly data through March 2007. Source: Bloomberg and Cumberland Advisors. © Cumberland Advisors

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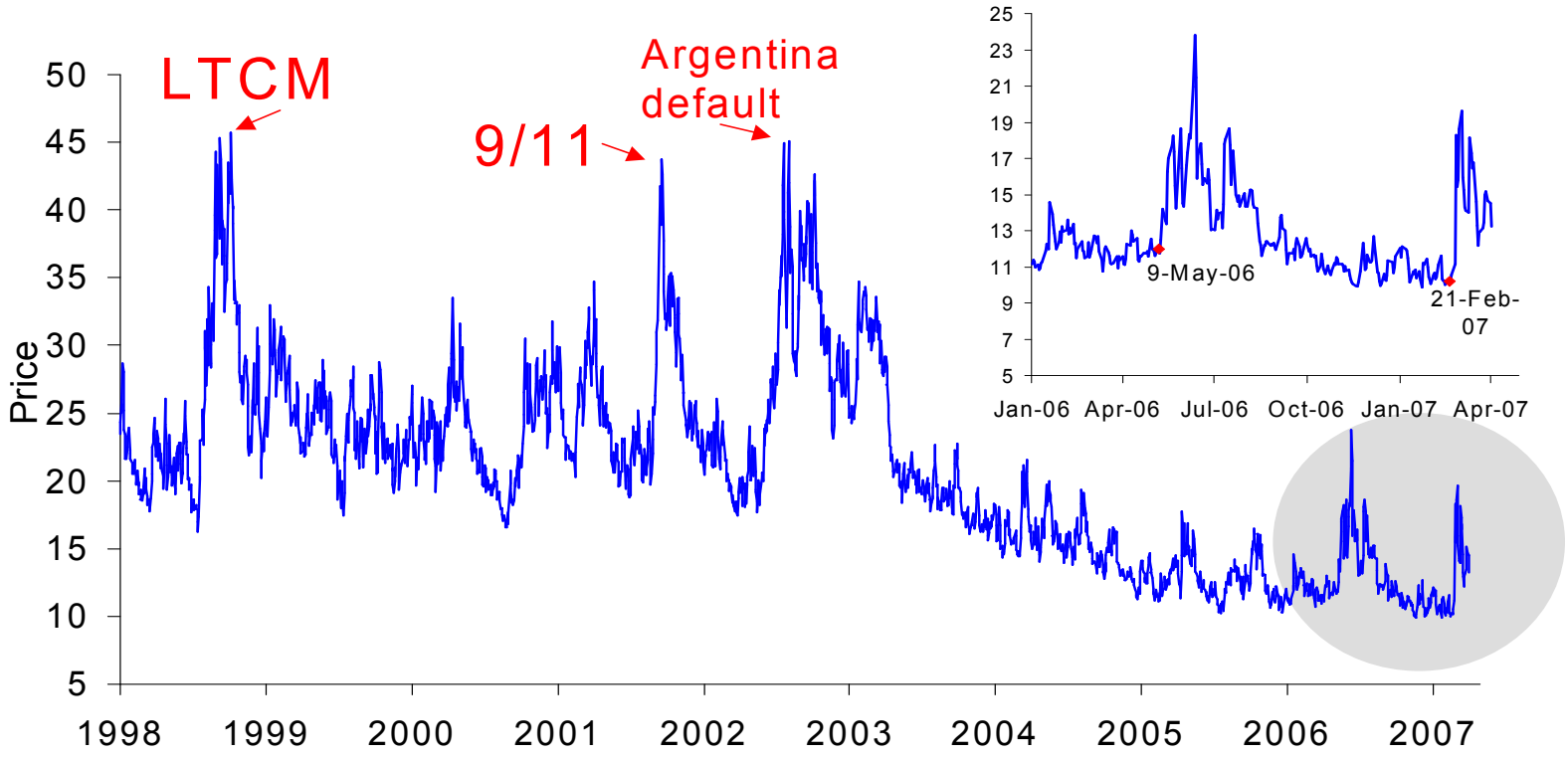
Chicago Board Options Exchange SPX Volatility (VIX) Index



Reflects a market estimate of future volatility, based on the weighted average of the implied volatilities for a wide range. Daily data as of April 3, 2007.
Source: Bloomberg and Cumberland Advisors. © Cumberland Advisors

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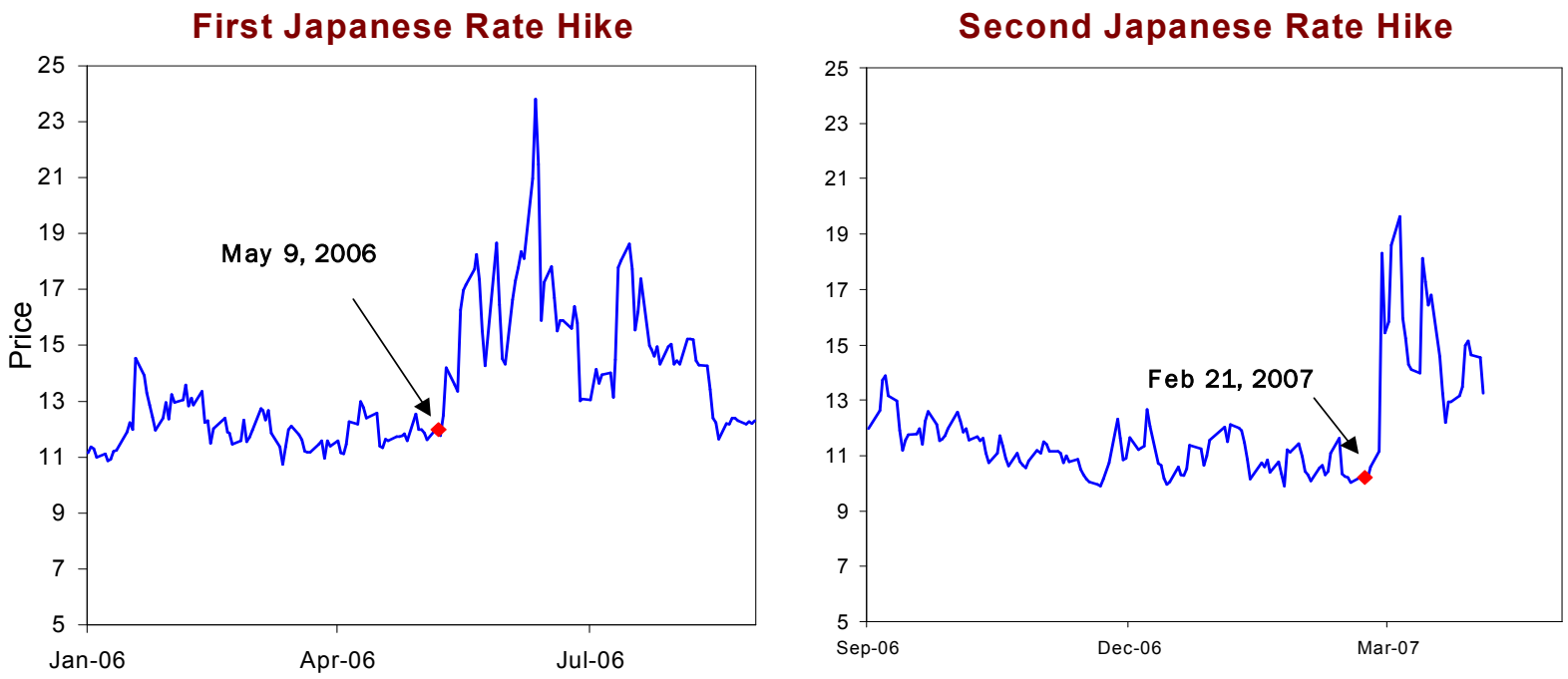
(2006 – Present)



Reflects a market estimate of future volatility, based on the weighted average of the implied volatilities for a wide range. Data as of April 3, 2007.
Source: Bloomberg and Cumberland Advisors. © Cumberland Advisors

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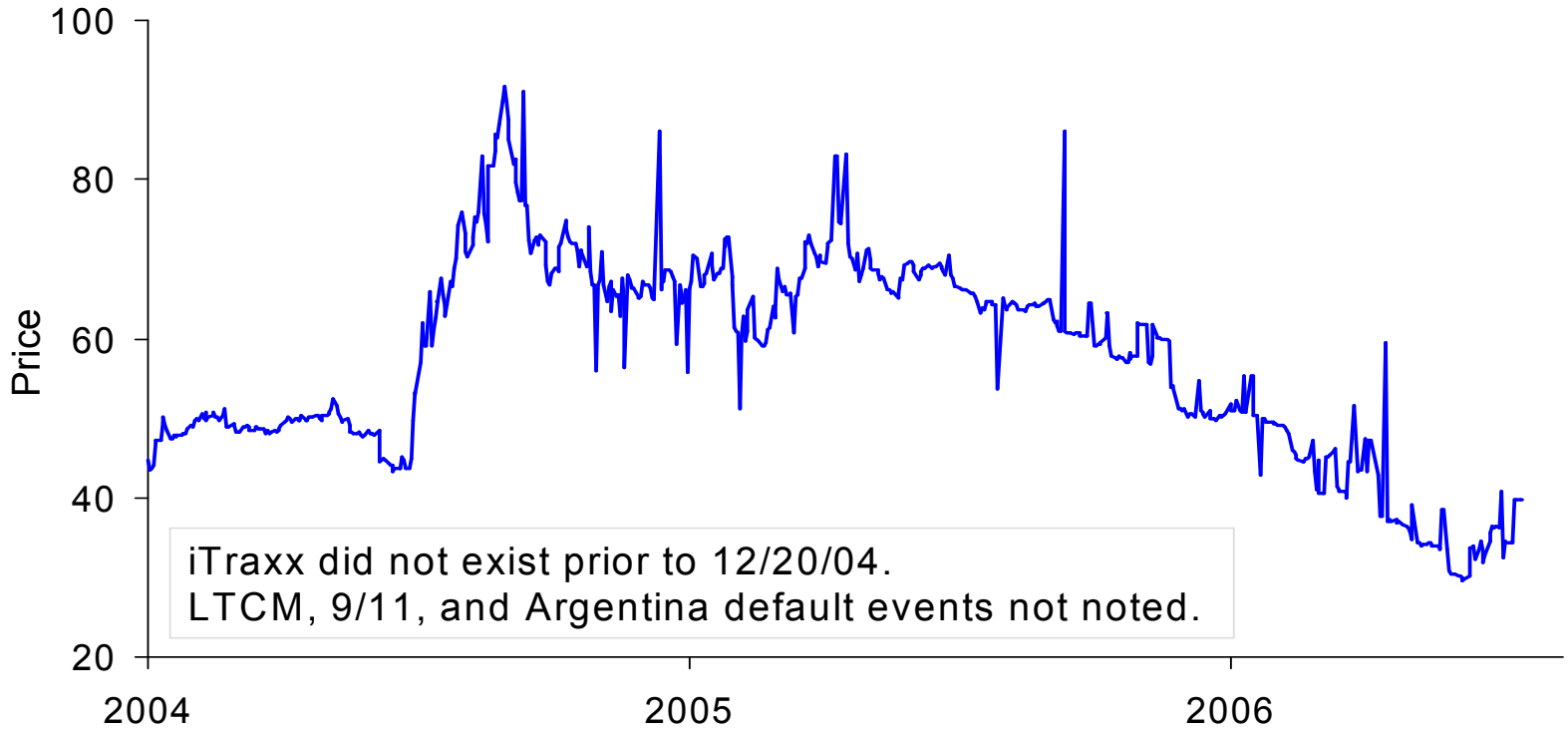
iTraxx: European Corporate Credit Default Swaps (CDS)



The iTraxx Europe Index is composed of 125 investment grade entities distributed among 9 sub-indices. iTraxx indices roll every 6 months in March & September. Data as of April 3, 2007.
Source: Bloomberg and Cumberland Advisors. © Cumberland Advisors.

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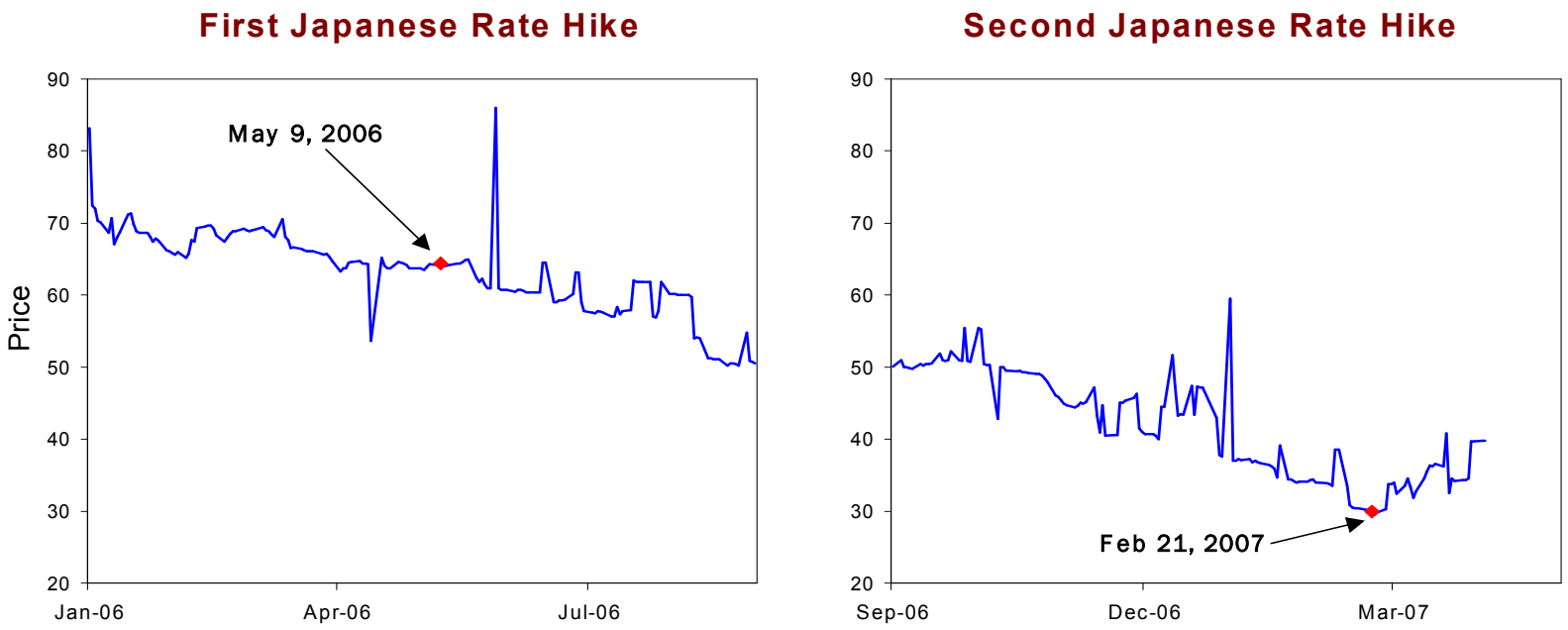
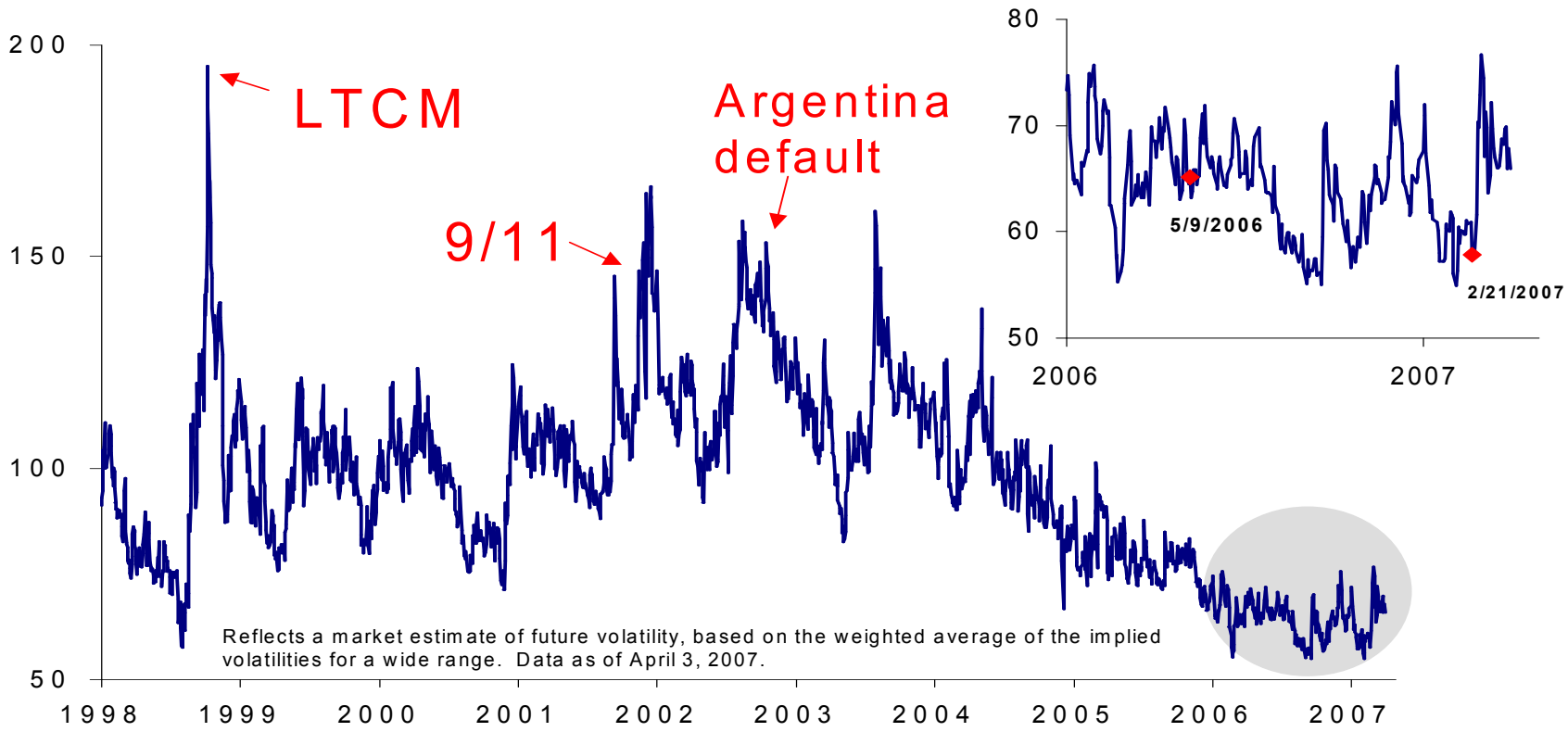


The iTraxx Europe Index is composed of 125 investment grade entities distributed among 9 sub-indices. iTraxx indices roll every 6 months in March & September. Data as of April 3, 2007.
Source: Bloomberg and Cumberland Advisors. © Cumberland Advisors

Merrill Option Volatility Index (MOVE)

Yield-curve weighted index of the normalized implied volatility on 1-month Treasury options



Reflects a market estimate of future volatility, based on the weighted average of the implied volatilities for a wide range. Data as of April 3, 2007.

Source: Bloomberg and Cumberland Advisors. © Cumberland Advisors

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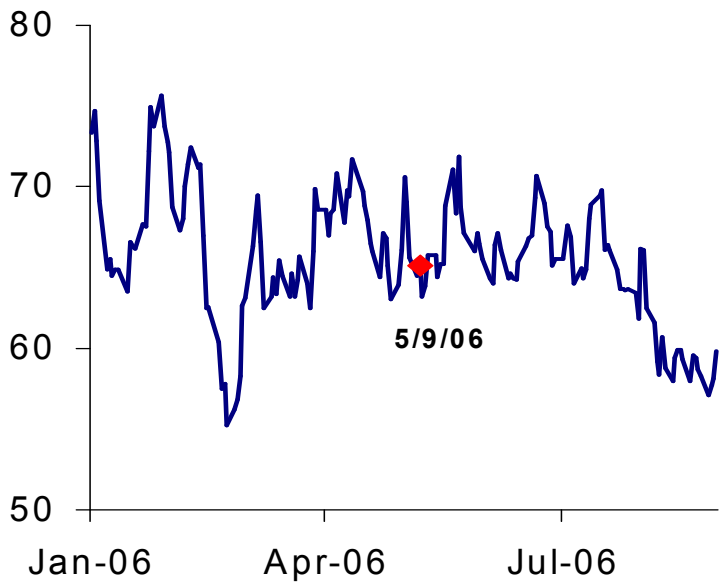
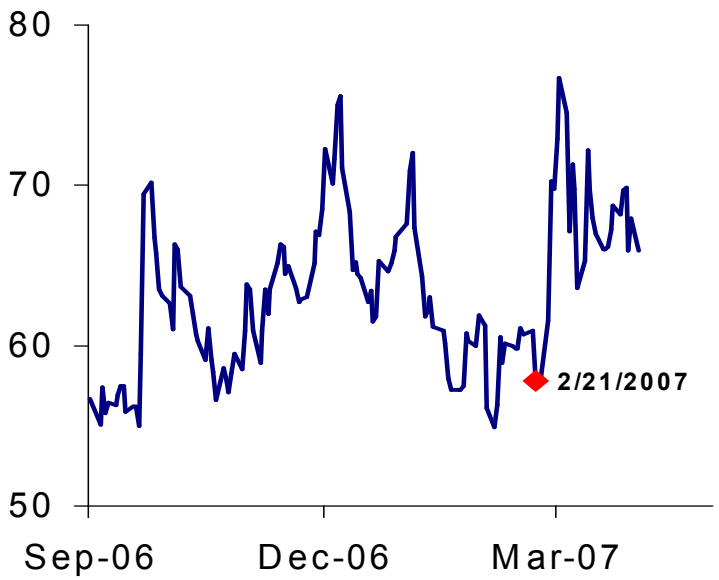
Merrill Option Volatility Index (MOVE)

Yield-curve weighted index of the normalized implied volatility on 1-month Treasury options
(2006 – Present)

First Japanese Rate Hike



Second Japanese Rate Hike



Data as of April 3, 2007. Source: Bloomberg and Cumberland Advisors. © Cumberland Advisors

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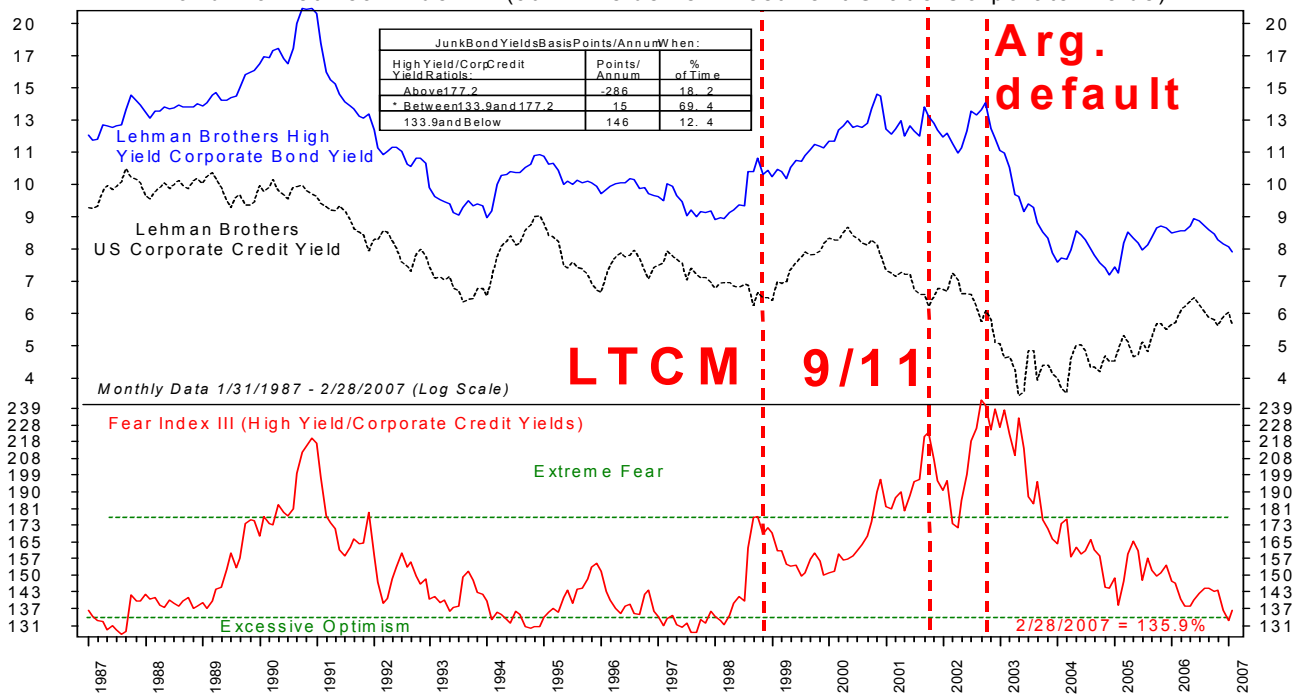
Global Bond Risk Premiums are Shrinking

In the United States

Bond Market Fear Index III (Junk Yields vs Investment Grade Corporate Yields)



Source: Ned Davis Research chart B336A and Cumberland Advisors. © Cumberland Advisors

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