“RED ALERT”
The Current Account Deficit and Corporate Bond Spreads

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EXECUTIVE SUMMARY

Corporate bonds offer very poor convexity. As with government bonds, they are subject to interest rate risk and currency risk. In addition, corporate bonds are also subject to specific credit risk. The Merton option pricing framework is invoked in this paper for the pricing of credit risk. At the extreme, a bankruptcy results in the equity holders “putting” the assets to the bondholders. It is the value of the “put” that should determine the yield spread of a corporate bond.

In this paper, we review the numerous factors affecting the value of the put option. We note that many post-1990 changes are in place in the global political and economic environment. The following graphic titled “Red Alert” illustrates the factors affecting corporate bond spreads in the global architecture. Corporate bonds recently benefited from new sources of demand related to the structural geopolitical changes of the 1990s.

These new sources of funding have facilitated a substantial increase in corporate leverage and deterioration in the credit worthiness of Corporate America. Perversely, these new factors have increased the theoretical value of the “put” and, in conjunction with the increase in leverage; have resulted in a much more risky corporate bond market. Yet, corporate spreads today are very tight.

This new geopolitical architecture has resulted in cash flows from abroad into corporate bonds which are not sustainable because they are associated with the massive U.S. trade imbalance, which is itself unsustainable. The sheer size of the trade imbalance and its greater concentration are indicative of increased risk. The larger the accumulated trade deficit, the more our national independence is threatened.

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I. Introduction

Investment risks associated with any asset are necessarily related to the structure of the economy. Until the last 20-30 years, the international economy was relatively closed, characterized by the U.S.-Soviet cold war, a communist China not yet reconciled to capitalism and a fragmented Europe. Today, all major nations participate in the global economy, China is a member of the World Trade Organization and a borderless Europe is unified. This more open landscape requires a re-examination of investment methodologies. An important economic regime shift has occurred and must be assessed.

This paper re-examines the risks associated with corporate bond investments. The paper argues that changes in the world’s political and economic architecture, especially changes in global capital flows, rules-based investing and increased balance sheet leverage, make investing in corporate bonds much riskier than traditional valuation methodologies imply.

Corporate bond valuations are fundamentally extremely rich. Corporate leverage is very high and yield spreads very narrow. Investors are relying on new “scientific methods,” the “kindness of foreigners” and the U.S. Federal Reserve Bank’s “omnipotence” to rationalize investments in corporate bonds. The stakes are high because lofty valuations leave little room for error. In this paper, we will review the risks associated with corporate bonds and the relevant data. The reader should ultimately evaluate whether the data reflects a random response to cyclical expectations or, more ominously, whether the coincidence of events indicated by the data is the result of coordinated geopolitical maneuvering.

The bigger picture is that higher economic volatility can be expected because of the profound geopolitical risks embedded within the new environment. This paper only touches on the potential for a state of complete chaos in the bond market. U.S. corporations dependent upon foreign investors have jeopardized the post-World War II U.S. financial system. This reliance on capital from abroad may ultimately result in geopolitical conflict as foreign ownership rights conflict with domestic political interests.


In sum, then, the global economy is exerting a tremendous influence on the corporate bond market in the United States. The combination of geopolitical structural changes, exchange rate policies, huge U.S. current account deficits, growth of the structured corporate bond product market (CBO), passive investing, underfunded corporate pension plans, threats of terrorism, and war have resulted in a corporate bond market driven more by global macroeconomic factors than by company-specific credit fundamentals. In spite of extreme amounts of corporate leverage, corporate bond spreads are approaching multi-year lows in Fall 2003 (See Exhibit A). The corporate bond market story is complex and the analytical framework for corporate bond valuation evolves as the financial environment changes.
II. Corporate Bonds as an Asset Class

Long-term uncovenanted lending of money can be a very risky investment. The proceeds of a bond issue are invested in “something” or “somewhere” to provide a higher return to the borrower than the interest cost on the bond. The bond proceeds of government issues generally bridge a budget gap. The monies received by a corporate bond issue may be applied to investment, operations, stock buy back, dividend payments or any (un)imaginable purpose. In all cases, the proceeds of a bond issue are used to benefit the borrower. The greater the amount borrowed the riskier the credit. No borrower, not even the U.S. government, is exempt from this fact.

Bond returns are limited to their fixed coupon payments and the return of the funds on loan. The whole of principal is at risk to erosion in the borrower’s capacity to repay, but bond investors are also subject to risks of inflation and currency devaluation. That is, the bondholder’s real return may be negative even if all coupons are paid and principal returned.

A corporate bond is particularly risky if the incentives of management are incompatible with the bondholder’s desire for stable, predictable cash flow. Specific covenants within the bond indenture limit actions of management. Unfortunately, today few investment-grade bonds are issued with such covenants.

Actions undertaken by management that increase the underlying volatility of the company are incompatible with the safety of the bond. Excessive leverage, underfunded pension plans, increases in the amount of risky assets (stocks, hedge funds, alternative investments, etc.) within the pension plan, large executive compensation packages—especially those that award options on the equity—all serve to increase the riskiness of the credit. All are presently in place and suggest greater company-specific volatility and risk.

Graham, Dodd and Cottle emphasized that investment in corporate bonds required great caution. Clearly, the investment philosophy they advocate is in sharp contrast to the “buy them all,” naive attitude prevalent today. They stated:

“Instead of associating bonds primarily with the resumption of safety—as has long been the practice—it would be sounder to start with what is not presumption but fact, viz., that a (straight) bond is a
security with limited return. In exchange for limiting his participation in future profits, the bondholder obtains a prior claim and a definite promise of payment, while the preferred stockholder obtains only the priority, without the promise. Nevertheless, neither priority nor promise is itself an assurance of payment. This assurance rests in the ability of the enterprise to fulfill its promise, and must be looked for in its financial position, record, and prospects. The essence of proper bond selection consists, therefore, in obtaining specific and convincing factors of safety in compensation for the surrender of participation in profits.”

“Our primary conception of the bond as a commitment with limited return leads us to another important principle of bond investing. Since avoidance of loss should be the primary objective, bond selection is primarily a negative art. It is a process of exclusion and rejection rather than of search and acceptance.”

III. The Merton Valuation Framework

Robert Merton’s framework for corporate bond valuation provides the requisite foundation for this process. Merton postulates that a corporate bondholder is long a risk-free bond and short a put option to the equity holders on the assets of the company. Based on this assumption, the spread on a corporate bond should be directly related to the company’s:

1. Volatility; and
2. Leverage.

Logically, the greater the leverage, the greater the underlying volatility. Increases in volatility are bad for the bondholder; decreases are good. The better the economic environment, the better the cash flow and the lower the leverage. Liquidity, industry dynamics, regulatory environments, bankruptcy rules and precedents and many other variables will influence the volatility. Company-specific financial and business cycle analysis, proxied by the VIX volatility index is a decent predictor of spreads on noncallable corporate bonds.

*The VIX Index measures expected stock market volatility.
Excepting a few important periods (1998 and 2002), the VIX Index, representative of business cycle volatility, has been a very good proxy for corporate bond spreads. Periods of high volatility correspond to periods of high corporate bond spreads, and vice versa.

Another factor in the Merton framework is event risk. Corporate bondholders are always subject to this risk, defined as a significant, sudden change affecting a company. The change can improve a company’s credit status but usually results in credit deterioration. The takeover of a company, fraud, court rulings and new technologies are all examples of event risk. Event risk can instantly change the company’s credit worthiness and, therefore, the value of the Merton “put,” in a very meaningful way.

**IV. Risks In The Current Market Environment**

The financial markets are open and global today, with unprecedented amounts of debt and enormous cross-border capital flows. The U.S. current account deficit (CAD) approximates $500 billion annually. Foreign investors lend approximately $2 billion to U.S. credit users daily. Foreign investors’ holdings of corporate bonds approximated $1.4 trillion in June 2003. The market for U.S. debt, including (and especially) corporate bonds is now very global. The macroeconomics applicable to corporate bond spreads is very different than in the past and very complex. The impact of this changed environment is shown in Exhibit B. In late 1997, the VIX Index spiked up, yet bond spreads remained stable. In 2002, spikes in bond spreads occurred independent of changes in VIX. The predictive power of the VIX indicator was violated, and violated badly.

The corporate put option sold by the corporate bondholder has changed. It is now much more tied to global macroeconomic forces. The determination of the put value is now the sum of the values of a series of puts, many of which are correlated. These puts are based in macroeconomic and geopolitical space and are subject to extreme changes in volatility. The following diagram illustrates the complex put and risk components in Merton’s corporate bond valuation framework:
Merton formulation: Corporate Bond = Long Risk free debt – Put

\[ \text{Put} = \sum_{i=1}^{15} \]

- \( \text{Put}_1 \) (Corporate Leverage, Operations) +
- \( \text{Put}_2 \) (GDP) +
- \( \text{Put}_3 \) (Stock Market) +
- \( \text{Put}_4 \) (War) +
- \( \text{Put}_5 \) (Terrorism) +
- \( \text{Put}_6 \) (Stock Options as Executive Pay) +
- \( \text{Put}_7 \) (Foreign Investors Asset Preferences) +
- \( \text{Put}_8 \) (Mispriced PBGC Premiums) +
- \( \text{Put}_9 \) (Information Asymmetries Potential of Credit Default Swap Market) +
- \( \text{Put}_{10} \) (Sustainability of Default, Recovery Assumptions Given Unprecedented Leverage) +
- \( \text{Put}_{11} \) (Change in Index Preferences, Roles, Asset/Liability) +
- \( \text{Put}_{12} \) (Change in Philosophy of Fed Policy) +
- \( \text{Put}_{13} \) (Change in Trade Policy and Current Account Deficit) +
- \( \text{Put}_{14} \) (Long-Term Interest Rates) +
- \( \text{Put}_{15} \) (Event Risk)

The composition of the Merton put is much different than in prior periods. The potential for unanticipated and uncontrollable changes in volatility is much greater. The combination of these factors makes the put more valuable to equity holders, implying wider spreads for bondholders.

**V. Current Account Deficit (CAD)**

Trade was last in balance for the U.S. in 1990. The U.S. balance of trade has progressively deteriorated since then. This erosion re-accelerated in 1998 and continued into 2003. (See Exhibit C.) 1998 was a noteworthy year because it marked the Asian Crisis and the bailout of failed hedge fund Long Term Capital Management by the U.S. Federal Reserve. The bailouts represented a re-acceleration of the Federal Reserve’s reflationary policies, which were brought to bear again in late 1999 to insure against Y2K risks and yet again in 2002 to fight deflation risk. These reflationary policies fueled a surge in U.S. domestic demand that resulted in a cumulative current account deficit (CAD) exceeding $3.5 trillion between 1998 and the middle of 2003. As a result, the stock of U.S. assets, primarily bonds, in foreign portfolios increased by a like amount, heightening geopolitical and economic risks.
Exhibit C: Deterioration of Current Account

The increase in the CAD to 5 percent of GDP in 2003 has important financial market implications. The chronic nature of the deficit means that the stock of U.S. credit market assets owned by foreigners which totaled $8 billion in 1990, $2.1 trillion in 1998, was $3.5 trillion in June 2003 and continues to increase $500 billion per year. The foreign ownership of corporate bonds was less than $400 billion in 1998 and exceeded $1.4 trillion in June 2003.

We observe in Exhibit D that purchases of corporate bonds by foreigners have exerted a dominant influence on corporate bond yield spreads. These purchases are insensitive to the deterioration in credit quality implied by the increase in corporate leverage. Foreign investment in corporate bonds of U.S. corporations may be based upon a higher order objective function and insensitive to credit fundamentals. In Exhibit E, we note that foreign investors have facilitated the increased leverage in U.S. corporations.
In Exhibit D, note that foreign purchases of corporate bonds declined by $30 billion during the third quarter of 2002. We further note that BBB corporate bond spreads widened by more than 1 percent during that period. (This corresponds to a 10 percent price decline in a 30-year bond.) This increase in spread occurred at a time of very limited corporate issuance (corporate bond supply). In particular, for example, in Exhibit F the supply of bonds issued collapsed in June 2002, yet the spreads widened considerably. Traditional theories would predict the opposite. Foreign investor withdrawal from the market at that time, as shown in Exhibit D in conjunction with banks’ contractionary actions in the credit default swap market, precipitated the tremendous widening in spread in corporates. The
corporate market was dysfunctional and illiquid at that time. Foreign purchases of corporate bonds accelerated during the next period and yield spreads declined by 2 percent during the November ’02 to April ’03 period. Net purchases of corporates by foreign investors approximate $70 billion from October 2002 to June 2003. There is no doubt foreigners’ asset allocation decisions are the main determinant of changes in corporate spreads today. Foreign investors absorbed virtually all of the corporate bond supply during that period.

In sum, the mix of monetary and fiscal policies in the U.S. has contributed to the increased CAD. The increase in the CAD has facilitated an increase in corporate leverage. In Exhibit E, we note foreign investors have provided the funds to accommodate increases in leverage in U.S. corporations. Normally, increases in leverage imply greater risk and result in wider spreads, rather than narrower spreads. Perversely, because of greater global capital flows into corporate bonds, corporate leverage has increased and corporate spreads have narrowed. The increased leverage increases the value of the put and also contributes to a more fragile global economy today.

VI. The Corporate Bond Obligation (CBO) Market

The CBO market is relatively new and has grown quickly. The CBO is an “inclusive” synthetic bond. A well diversified assortment of corporate bonds is placed in a trust. The cash flows associated with the trust are structured, or “tranched” to simulate a bond and specify cash flow priorities. The trust’s investments in the corporate bonds are usually leveraged. The CBO market provides investors a vehicle for the purchase of diversified credit risk. These deals are constructed and rated on the premise that historical average default rates and recovery values will persist in the future. A diversified credit portfolio will almost certainly insure this result. Thus, the rating agencies rate the various tiers of the CBO structure as a function of cash flow priorities, historical credit default rates, recovery assumptions, leverage and diversification. (Please note: PIMCO is a very significant manager of structured products of this form.) The CBO and CDO (Collateralized Debt Obligation) structures are the epitome of macro-risk products.

So, to the extent that credit ratings are predicated upon cross-sectional specific financial data, and not on unforeseen or forecasted changes in the macro “environment” (such as the potential for geopolitical or trade-related events), then these CBO structures provide an investor a naive way to participate in the global reflationary theme and to some extent, avoid the risks associated with oversize credit positions.
The CBO structure shields the investor from proactive, anticipatory rating agency actions directed toward a specific issuer. The CBO structure also shields the investor from mark-to-market risk. Exhibit G indicates the growth in the CDO market. The size of the CDO market increased from $188 billion in 1998 to over $500 billion in 2002. The CBO market facilitated many purchases of corporate bonds by foreign investors.

Ultimately, the CBO/CDO investor must question the relevance of historical statistics in a substantially changed global economic environment. The investor should consider the yield compensation offered by the investment within the context of his or her risk assessment. That assessment should take account of macroeconomic and political risks outlined previously, including:

1. Increased corporate leverage
2. Increased global capital flows
3. Under funded corporate pension plans
4. Executives’ ownership of options on their equity
5. A large and rapidly growing Credit Default Swaps Market
6. A terrorist-laden world
7. A secular period of rapidly growing federal debt
8. A period of increased trade friction
9. War

The assessment should also consider the potential for changes in market volatility resulting from any of these aspects of the new environment. Investors who reassess the underlying statistics of CBO/CDO deals with these risks in mind will likely demand higher yields as compensation for the increase in risk.

VII. Credit Is Part of the Benchmark—“Buy Them All”

Indexed corporate bond portfolios are another naive method for investment in corporate bonds. Most institutional investors hold bond portfolios benchmarked by indices containing corporate bonds. Because of the extreme credit volatility in 2002, significant sub-par performance by many money managers has motivated many participants to “index” their credit risk. The compositions of the indexed corporate bond portfolios are based solely on ratings specifications and the supply of specific issues in the market. Indexing of credit risk is an attempt to reduce the impact of the put option from a company-specific risk to a more macro risk relative to a bogey. Thus, the investment policy is reduced to a naive supply-driven method, which completely ignores the determinants of default risk.

A supply-driven methodology may make sense for other asset classes such as stocks, but this approach makes no sense for bond investing. It requires an investor to own a pro rata share of whatever bonds are issued, so the more a company borrows, the more money the investor lends that company. The greater supply requires an increased commitment to the issuer by the naive investor even though the credit is deteriorating under the weight of more borrowing. Ultimately, the increased corporate leverage
results in a downgrade. The downgrade causes the issuer to drop out of the index. At that point, the naive investor sells his investments at a substantial discount. Certainly, this method of investment has a limited tenure and is one to which Graham, Dodd and Cottle would have objected.

**VIII. Options on Equity as Executive Compensation**

Executive compensation in the form of options on the firm’s equity is a negative for bondholders. Options on equity create an extreme moral hazard situation. The executive is torn between maximizing shareholder value and maximizing his risk-adjusted wealth. The presumption that they are one and the same is not correct. While moral hazard could be reduced if actual equity replaced the options, in either case, the interests of the bondholders are not a priority for the “equity-holding,” decision-making executive.

The value of an option is a function of the volatility of the underlying asset. The greater the volatility, the higher the value of the option. Executives with options have an incentive to increase the firm’s leverage. Increases in the debt of the company relative to equity and increases in holdings of riskier assets in the pension plan serve to increase the firm’s leverage. The executive’s incentive is always incompatible with the bondholders’ interest and may be incompatible with shareholder interests as well. Bondholders and shareholders both suffer when these executive options are restructured. Bonds should never be held in companies that permit the restriking of options on compensation. The restriking of options translates into, “Take more risk; nothing lost for me if I lose, so let’s play again.”

By contrast, National Rural Utilities’ executive bonuses are related to the credit ratings of the firm. This type of bonus plan merges the interest of both bondholders and shareholders. Using Merton’s framework, we would expect that in this case, expected volatility would decline, reducing the value of the put and boosting the value of the company’s bonds. The following graphic, Exhibit H, confirms this expectation. National Rural Utilities bonds have indeed experienced an extraordinary compression in credit spread.

![NRUC 7.25 03/01/2012 Spread](NRUC_7.25_03/01/2012_Spread)

*Source: Lehman Brothers*

*Exhibit H: Nat Rural Spread to 10-year Treasury*
IX. Banks as Conduits of the Federal Reserve Bank and the Credit Default Swap (CDS) Market

Banks are normally the conduits by which monetary policy is transmitted to the economy. However, in Exhibit J, we see that despite Fed easing, commercial banks did not increase their holdings of corporate bonds during most of 2002. On the contrary, there is reason to believe that banks contributed to a credit contraction when they bought insurance in the credit default swap market during that period.

The creation of the credit default swap market introduced a new set of dynamics to the corporate bond market. Credit default swaps allow “investors” (bondholders, commercial banks, hedge funds, insurance companies, investment banks, etc.) to buy and sell insurance on any credit in a largely unregulated market. Credit default insurance purchases can exceed the existing stock of a company’s debt. Purchase of credit default insurance results in the widening of an issuer’s credit spread and an “artificial” supply of an issuers’ debt. Moreover, when a bank or a hedge fund manager who also trades in the bank loan market purchases credit default swaps, they may be trading on privileged information. In October 2002, this author published a comprehensive report outlining how the CDS market could be used to capitalize on short positions in corporate bond spreads. At that time, corporate bond spreads were at an all-time wide interfering with the macroeconomic transmission of Fed policy.

In October 2002, it was abundantly clear that the Fed’s reflationary effort was being thwarted. The extreme dislocation of spreads in the bond market interfered with the transmission of monetary policy to the real economy. In November 2002, the Fed directed investments into corporate bonds. Chairman Greenspan had indicated that spreads were a policy variable and Governor Bernanke opened the door to direct credit insurance from the Fed. Commercial banks served as the conduits for the investments. The banks’ participation was outright and in structured form. Clearly, the Fed invoked a “too big to fail” doctrine toward the corporate bond market at large. In Exhibits I and J we note the abrupt step function increase in bank holdings in November 2002 of corporate bonds as a percent of total assets.

Source: Federal Reserve

Exhibit I: Quarterly Change in US Commercial Bank Holdings of Corporate & Foreign Bonds

On November 13, 2002, Fed Chairman Greenspan testified that the Fed was monitoring (targeting) investment grade corporate bond spreads. The massive reflationary efforts of the Fed and the promise to “go unconventional” if necessary have contributed to a substantial reduction in corporate yield spreads (See Exhibit F). Greenspan noted:

“In financial markets, risk spreads on both investment-grade and non-investment-grade securities have widened. It was in this context that the Federal Open Market Committee further reduced our target federal funds rate.”

“Clearly, it would be desirable to avoid deflation. But if deflation were to develop, options for an aggressive monetary policy response are available.”

On November 21, 2002, Fed Governor Ben Bernanke delivered his important Fed reflation speech, in which he stated:

“…the Fed is relatively restricted in its ability to buy private securities directly. However, the Fed does have broad powers to lend to the private sector indirectly via banks. Therefore a second policy option would be for the Fed to offer fixed-term loans to banks at low or zero interest, with a wide range of private assets (including corporate bonds, commercial paper, bank loans and mortgages) deemed eligible as collateral.”

X. Change in Fed Policy

Chairman Greenspan is an advocate of free markets. He believes markets should be allowed to function freely until they need help. He believes he understands complex financial matters and can devise and implement remedies when required. In essence, he believes the markets need to be insured and that the Fed, rather than being merely a bank, is an insurance company. This interventionist philosophy has characterized his tenure at the Fed. The insurance program began with the stock market crash in 1987 and continues today. The crisis prevention Fed policies were applied to:

a) 1987 Stock Market Crash
b) 1991 Savings and Loan Crisis
c) 1997-98 Asian Crisis
d) 1998 Bailout of LTCM  
e) Y2K Risk  
f) NASDAQ Crash in 2000  
g) September 11, 2001 Terrorist Attacks  
h) November 2002 Deflation Prevention

The remedies have caused a massive misallocation of global capital. **The $3.5 trillion accumulated current account deficit is the Greenspan legacy.** The U.S. current account deficit is a source of increased global frictions, and political and economic risk. Ironically, the Chairman himself frequently cites the current account as an important source of risk in his testimony to Congress.

Many of the financial externalities imposed upon the system from Greenspan’s Fed policies have been borne by the pension system. Risk has been reallocated to workers and away from the banking system. Chairman Greenspan also championed the transfer of risk from the banking system to pension plans. He believes that certain forms of risk, like credit risk, are more appropriate for “long-term” investors. (One has to presume commercial banks are not going concerns and, therefore, not long-term investors.) It is the pension plans who have held the bag for both the credit disasters in 2002 and the mortgage repayment wave of 2003. First, the defaults and corporate bond downgrades depleted pension plans. Then, the increase in mortgage repayments that resulted from the Fed-orchestrated reduction in rates was thus transferred from pensioners to homeowners to foreigners (CAD), essentially, robbing Peter to pay both Peter and some unknown foreign producer. The raid on Peter’s pension plan is a bad deal for Peter.

This risk transfer to the pension system persists today. The scientifically based, structured assets markets provide the mechanism for the transfer of assets from banks to the securities market. The securities are then purchased by pension plans that bear the risks the banks rejected.

The macroeconomics of the risk transfer may be compelling in the short run but the transfer may lack a moral foundation and be harmful in the long run. Risk in the commercial banking system is an immediate, high multiplier, macroeconomic risk. Risk in the deferred pension plan is perceived as a low multiplier, deferred consequence risk. The pensioner does not change spending patterns when the funding of his pension plan changes. However, he will change behavior when benefits are cut. Thus, the short run macroeconomic benefits created by policies that bring pension plan savings forward, may ultimately be swamped by the longer-term economic costs of underfunded pension schemes. It does not pay to be, Peter, the long-term risk target when a sustained correction to the global misallocation of capital is in place.

The misallocation of global capital will eventually be corrected. The process by which the correction occurs is important for asset markets and for civil liberty. The correction can occur in many ways through policies that govern:

1) Inflation  
2) Repudiated Obligations  
3) Default on Debt  
4) Debasement of the Currency  
5) Restructuring of Debt  
6) Real Exchange Rate Adjustments  
7) Regulation and Protectionist Legislation

Most of these methods are “ugly,” uncivil and amoral. An extreme exchange rate correction is the most disguised form and, therefore, the most honorable. Exchange rate changes in conjunction with different

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4 Excerpt from Remarks by Chairman Alan Greenspan Before the Economic Club of New York, New York City, December 19, 2002  
5 Remarks by Governor Ben S. Bernanke before the National Economists Club, November 21, 2002
inter-country inflation rates contribute to a correction in the trade balance, but this process is very slow. Trade imbalances continue accruing during the corrective phase. It is much too late for a gradual real exchange correction policy for the U.S.

There will be a new Fed chairman at some point. The questions are when and who? The new chairman will invoke his or her own view of the world and the role of the Fed. If the new chairman’s view and policies are Greenspan-like, the markets will implode because the reflationary creation of debt cannot continue forever, but if the person’s viewpoint differs, then the correction can occur differently. The process will substantially affect bond and currency markets. A dramatic reduction in foreign investment in corporate bonds will coincide with a trade balance adjustment. The dollar can decline in an orderly fashion or it could go into a free-fall coincident with the continued explosion in U.S. debt and rapidly increasing interest rates. The strength of the military and its effective use will influence the path. The unwinding of leverage is never straightforward, but is always painful, particularly when it occurs between countries, as it must to resolve the U.S. current account deficit problem.

Past Fed policies have increased geopolitical risk. The accumulated current account deficit in the U.S. today is the greatest threat to world peace since World War II. The corrective phase will likely increase financial risk. The Fed’s reflationary policies are supportive to corporate bonds in the short run, but will be devastating to them in the long run.

**XI. The Underfunded Pension Plan**

Corporations in the United States, in aggregate at year-end 2002, were 20 percent underfunded in their defined benefit plans. The underfunding was heavily skewed toward older, large, unionized industrial companies. However, there were many underfunded companies at year-end. The underfunding is essentially debt of the company. Most of these pension plans hold allocations to the stock market approximating 60 percent of plan assets. The decision to increase allocations to these levels was a decision to increase the exposure of the corporations to macroeconomic risk, resulting in riskier corporate entities. This result is bad for bondholders.

Many argue that we should not be alarmed with underfunded pension plans because the problem is primarily confined to a handful of big companies. This analysis misses the important dynamic effects of the Keynesian multiplier in reverse. Because the troubled companies are so large and the pension liability accrues so quickly when the stock market falls, corporate creditworthiness tumbles quickly with the stock market independent of the operations of the company. Bad economics for large companies is transmitted directly to the wider economy. The dominos fall quickly.

The bondholder is short a put option on the operations of the company and a put option on the stock market. The value of these options should be reflected in the spread on the bond. Valuation of the short put on the pension plan is a function of:

1. Plan portfolio mix (the greater the percentage of risky assets, the greater the put value)
2. Funding status of the plan (In the money—underfunded. At the money—approximately funded. Out of the money—funded plan)
3. The difference in the value of the stock market at last accounting period relative to today. (The greater the difference the less the put value.)
4. The earnings rate estimated for plan assets and utilized for accounting purposes (the lower the rate the better)
5. The yield and duration of the bond portfolio relative to the duration and yield of the plan liability. (The lower the difference in duration between portfolio and liability, and the greater the yield difference between the plan assets and liability accrual rate, the better.)

A great deal of analytical modeling of the pension problem has been undertaken at PIMCO. Our results indicate that a level of 850 on the S&P 500 would place the U.S. financial system in jeopardy. The underfunded status of the plans would increase, substantially jeopardizing investment grade ratings for many of the troubled companies. S&P 650 would probably put these companies out of business, as the accrual of synthetic debt would overwhelm the value of the firm’s assets. Moreover, as Exhibit...
K indicates, the level of the S&P seems correlated to VIX. The correlation exists because the market acknowledges that the pension problem put is “at the money” near S&P 850.

Regression Plot: Weekly S&P vs. VIX - 2001 to Present

Source: Bloomberg

Exhibit K: Volatility of the S&P 500 correlated to market level

The pension problem is exacerbated over time due to the power of compounding and the prevailing 60%/30% stock/bond mix. The assumed 7½ percent earnings rate on this mix of plan assets exceeds the dividend yield on the S&P by 5½ percent and the yield on the bond portfolio by 3 percent. Capital appreciation is therefore required to stay even. If we postulate flat bond and stock markets for any meaningful period, the compounding problem results in substantially greater underfunding in the future. The increased forward underfunding is the result of an artificially high-expected earnings rate on plan assets relative to prevailing market yields. In a static, low return financial environment, the corporate bond put option’s value increases as a function of time.

**XII. Pension Benefit Guaranty Corporation (PBGC) Premium Pricing**

The Pension Benefit Guaranty Corporation’s pricing of the insurance for plan assets must change to better reflect variations in risks of different plans. The pricing of premiums to reflect the risk of the asset allocations relative to liabilities would probably change the stock/bond mix to favor bonds. Any moderation in the allocation to risky assets (i.e., deleveraging the firm) would accrue to the benefit of the bondholder. The pricing of premiums should also penalize plans with a mismatched asset-liability profile. Longer duration bond portfolios are required to achieve a better match. These pension dynamics are extremely important to corporate bond valuation. Corporations increase leverage when the PBGC insurance is priced too cheaply and delever as the pricing of the premium increases.

It is the pricing of the premiums charged by the PBGC that provides asset allocation “arbitrage” opportunities. Pricing skews can be identified through a mere examination of plan asset allocations. A persistent desire for risk in pension portfolios is indicative of a systemic under pricing of insurance premiums. The tax arbitrage mandates that stocks are held at the corporate level and bonds are held in the pension plan where income is tax-exempt. The very high allocations to equities in pension plans today indicate that premiums are priced much too low. The mis-pricing is so significant that the tax effects become secondary and insignificant.
XIII. The Stock Market

The absolute level of the aggregate market is crucial to the valuation of corporate bond spreads. At year-end 2002, interest rates on 30-year bonds were 4.8 percent and the level on the S&P 500 was 850. There were numerous underfunded corporate defined benefit pension plans. We would characterize the put option on the aggregate stock market as “at the money” at that time. A fall in the stock market would cause the put option to go in the money and an increase in the stock market would cause the put to go out of the money. As the put goes into the money, the present value of the debt of a company increases.

A fall in the stock market may also exert direct microeconomic effects. The fall of a particular company’s equity causes its MAD ratio to worsen (the MAD ratio is a debt/equity ratio that adjusts the equity valuation from book to market). If the individual company’s stock falls coincident with a general fall in the stock market and the company’s pension plan is underfunded, then the MAD ratio deteriorates quickly because the debt is increasing and the equity value is decreasing.

XIV. The Irate Union Worker and State Plan Gimmicks

Allocations to equities in public pension and, 401K plans, endowments, Taft-Hartley plans and many other portfolios were high during the late 1990s. The hit to wealth caused by the recent fall in the stock market affected many people.

The Taft-Hartley and public pension plan circumstances are particularly interesting. Taft-Hartley plans are multi-employer union plans. The bull market in stocks during the ‘90s resulted in substantial excesses in these pension plans. Unlike corporations that could utilize the excess funding credit for a contribution holiday, Taft-Hartley plans could not. Instead, the Taft-Hartley plans increased the benefits promised to their constituents. The subsequent fall in the stock market has subjected the plans to difficult circumstances and many are now in deficit. The unions must concede benefits and/or the many employers, whose obligations to the unions are contractually set, must cough up more money. Labor unrest will result in greater social instability.

State pension plans have undertaken a different solution to their unfunded problem. Many have issued taxable pension obligation bonds (a conveniently recent addition to the LBAG Index) to resolve their problem. The bond issue proceeds are invested in “higher return” equities. If only it were so simple! There is no need for a 30-year bond issue at a rate of 5½ percent when one can just buy futures contracts on the S&P 500 at an implied rate of Libor.

XV. The Interest Rate

The long-term interest rate exerts a powerful direct influence on the funding status of pension plans. The defined benefit pension plan obligation is typically a long duration liability. Increases in the long-term interest rate reduce the liability and improve the funding status. Decreases in the interest rate cause the liability to increase. For any given discreet change in the long-term interest rate, the absolute value of the increase exceeds that of the decrease.

XVI. Correlated Events

Bond prices are expected to increase when interest rates decrease. However, when the issuer’s capacity to repay debt increases when rates decline, then the issuer’s bond prices may actually fall with the decline in sovereign interest rates. The combination of a fall in the stock market and a fall in sovereign interest rates can have the correlated affect of deterioration in the MAD ratio, and deterioration in pension funding status. Somewhere around 850 on the S&P, we might reasonably expect the correlation of interest rate declines and stock market declines to become the rule rather than the exception. See Exhibit K.

XVII. Foreign Central Banks, Geopolitics and War

Historically, countries divide into one of three groups during war. A country is either associated with a specific side or it is neutral. Allied countries tend to work together to win the war. Contributions to
a war effort may take many forms, including financial. The allied country becomes part of a team and follows the team captain's directives.

If you believe the French, the United States' decision to invade Iraq was made in December 2002. Post 9/11, President Bush frequently commented about the importance of the terrorists' finances. There is a need to discover and cut off those funds to successfully fight terrorism.

Clearly, funding is crucial to the terrorist organizations, just as funding is crucial to any business. It is certainly the case that an inflow of funds to the U.S. is required to successfully engage in a Guns and Butter war. The current war in Iraq is a Guns and Butter war. Absent an inflow of funds from abroad, a strong domestic economy is required and the production of guns substitutes for consumption (butter) and exports. Normally, the domestic population sacrifices to support war finance. The U.S.-led attacks on the terrorists in Afghanistan and on the Hussein regime in Iraq have been funded by money borrowed from abroad by the U.S. government. There is a void of domestic sacrifice.

The flow of funds data indicates a substantial inflow of foreign capital into the U.S. in the final quarter of 2001 following 9/11/01. Inflows in Q3 2001 totaled $244 billion. Inflows in Q4 2001 exceeded Q3 by $200 billion. Those flows are probably related to foreign support for U.S. markets in response to the September 11 terrorist attacks. Similarly, in preparation for war, the inflows in Q3 2002 were $683 billion and $608 billion in Q4 2002. In 2002, the flows into the U.S. increased to help finance the Iraq War. In both cases, the flows were disproportionately invested in corporate bonds. A well functioning capital market is a requisite for successful war policy. So, the evidence supports the notion that geopolitical matters mandated external investment into U.S. corporate bonds. That investment in support of the war effort can be viewed as a foreign contribution. In essence, investors in Asia (largely Chinese and Japanese) are financing the military effort. Predictions for geopolitical maneuvering exceed most credit analysts’ capacity.

**XVIII. Change in Trade Policies**

A change in trade policies by any major global trader could cause a shock and severe dislocations in the financial markets and the global economy. The identity of the instigator and the framework of new policies are important. It is very difficult to forecast the form that change would take and to pin down the identity and timing of the instigator. However, we do know that the U.S. markets will almost certainly be affected. The U.S. is the debtor country with the huge trade deficits.

Trade policy changes could take many forms, including the following:

1) Currency policy
2) Tariffs
3) Shift in monetary policy and fiscal policy mix

The change in trade policy will increase the volatility in the asset markets. A response to the trade policy changes by other trading nations will exacerbate the increase in volatility.

**XIX. War and Terrorism**

Terrorist activities and war increase risk and uncertainty. Terrorist activity is, by definition, random in time but directed at particular targets. War is known at a point in time. The outcome, scope and longevity are not known. A country like the U.S., involved in war and a target of terrorism, must finance the war and the fight against terror. Battling each is expensive. Battling both for a sustained period taxes a country’s wealth, inhibiting its ability to support domestic needs. Therefore, defending against terrorism and fighting wars cause a country’s budget deficit to increase, its bond quality to deteriorate and the volatility of the country to increase. Corporate bond valuations should suffer during these periods.
XX. Trade and Protectionism—
The Importance of the Objective Function

The CAD has continued to deteriorate despite 10 percent depreciation in the trade-weighted dollar. The continued deterioration in the CAD is largely a result of increased trade deficits with the Chinese. The Chinese currency is pegged to the dollar at a very competitive rate. The recent depreciation of the dollar has caused Chinese production to become more competitive with the rest of the world and has not changed in relation to the U.S. Annual U.S. imports of Chinese goods were nonexistent in 1987. U.S. imports of Chinese goods approximated $125 billion in 2003.

U.S. officials and politicians are clamoring for an adjustment in the Renminbi (Chinese currency)/U.S. Dollar exchange rate. As of October 2003, the Chinese have refused to re-peg at a higher level and have refused to float their currency. As a substitute, they have suggested that they will invest in the corporate bond market, thereby subsidizing U.S. corporations and making them more competitive as their financing costs are reduced. (Recall that the Fed had dropped interest rates to 1.25 percent in November 2002, yet because of the increase in yield spreads, financing costs for corporations had actually increased during the year.) This Chinese proposal would allow the Chinese to continue to export to the U.S. and to accumulate U.S. dollar claims. The Chinese claims will be claims on U.S. assets, including corporate assets.

In a similar vein, the Japanese have expanded their money supply at an annual rate of 21 percent from September 2001 to September 2003. Such a massive expansion is intended to devalue the yen. Japanese officials have also undertaken direct intervention in the currency market. Both measures are intended to maintain a competitive edge for Japanese exports. They sell us Toyotas that have an expected life of five years, and they take a claim on our future earnings. The Toyotas end up in a junkyard; the claims persist. Ultimately, the real value of the claim may be questioned. These trade dynamics lead us to an examination of the foreigner “objective function.”

XXI. Objective Functions

It is never possible to know another’s true objective function. One can only speculate. We are hard pressed to understand the objective function of our own country, let alone speculate about the motives of another country. Investors, however, must engage in the business of “objective function” speculation, so here are a few examples:

U.S.: Maintain military dominance. Maintain growing economy. Use foreign capital to support a guns and butter economy. Avoid as long as possible the eventual dramatic reduction in living standards imposed by globalization.

Japan: Accumulate foreign reserves to provide for investment elsewhere and support the retirement of an aging population. Establish extensive offshore production facilities to minimize disruptions associated with a currency adjustment, the expected decline in the domestic labor force or a major earthquake. Continue to provide U.S. with an increase in loans providing the Japanese greater political leverage with U.S., China and Russia and maintaining its exchange rate to the U.S. dollar. Severing or loosening ties with Japan would be very bad for the U.S. and vice versa.

China: Export at all costs to accumulate foreign reserves. Generate employment opportunities for the large number of workers entering the labor force and for those being displaced from State-owned enterprises. Export markets will support military and private industrial infrastructure development. Understand that industrial infrastructure development over time is much more important than the value of their investment portfolio. Import high-tech technologies. Need to keep the game going to establish geopolitical superiority. Will help U.S. financial decay through the export of consumer products and the accumulation of debt. Very low opportunity cost associated with their factors of production.

Europe: Formation of European Monetary Union (EMU) is motivated by desire to form an important geopolitical block that is independent of the United States and politically competitive with Russia.
Expansion is accomplished at significant domestic economic cost. Need to establish military to compete geopolitically with U.S., China and Russia.

**Russia:** Export natural resources to the world and accumulate significant reserves, thereby reducing political and financial dependence. Play both sides of geopolitical fence as it continues to increase its regional dominance.

**Maximizing investment profits does not appear in any of the postulated objective functions for any of the countries above.** It appears that World War III is being fought in the financial and real goods markets. The imbalances in power are huge. The longer the U.S. attempts to run a guns and butter economy, the more quickly other countries establish a fortress from which they may operate. Chinese participation in the global game has increased the speed of the game and shortened game time. The sheer size of the Chinese involvement changes the global regime substantially and also speeds up changes in the regime.

The present strategy of foreign countries is to fund Corporate America in spite of increasingly poor credit fundamentals. Ultimately, a more vulnerable U.S. economy will result from this globalized trade. A large shock can result in a funding crisis and substantial bankruptcies. In bankruptcy, foreigners may hold the superior claim to those U.S. corporate assets. The large shock will cause a funding crisis at the U.S. Federal level simultaneously. The capacity of the U.S. government to invoke a corporate “too big to fail” doctrine at the time of the shock will be questioned. In due course, absent U.S. military objections, foreigners would receive the keys to the factories in the U.S. to satisfy their accumulated claims.

The increase in the amount of securities held by foreign central banks as a percent of total foreign holdings (See Exhibit L) is indicative of increased government interference in the markets. This change in the distribution of holdings is a foreign policy variable. The interference is geopolitically motivated and is a direct result of the “objective functions” described above.

![Graph of Foreign Official Holdings of TSYs+Agencies](chart.png)

**Source:** Federal Reserve

**Exhibit L: Foreign Official & Private Holdings of Treasurys & Agencies**
XXII. Conclusion

Corporate bonds offer very poor convexity. As with government bonds, they are subject to interest rate risk and currency risk. In addition, corporate bonds are also subject to specific credit risk. The Merton framework has been invoked in this paper for the pricing of credit risk. At the extreme, a bankruptcy results in the equity holders “putting” the assets to the bondholders. It is the value of the “put” that should determine the yield spread of a corporate bond.

In this paper, we have reviewed the numerous factors affecting the put. We have noted that many post-1990 changes are in place in the global political and economic environment. Corporate bonds have recently benefited from new sources of demand related to the structural changes.

These new sources of funding have facilitated a substantial increase in corporate leverage and deterioration in the credit worthiness of Corporate America. Perversely, these new factors have increased the value of the “put” and, in conjunction with the increase in leverage, have resulted in a much more risky corporate bond market. Yet, corporate spreads today are very tight.

The cash flows from abroad into corporate bonds are not sustainable because they are associated with the massive U.S. trade imbalance, which is itself unsustainable. The sheer size of the trade imbalance and its greater concentration are indicative of increased risk. The larger the accumulated trade deficit, the more our national independence is threatened. The present trade imbalance could not exist without a powerful U.S. military. Sustaining the trade deficit requires retaining military superiority. Both the trade deficit and the military require capital. Today, China provides a disproportionately large amount of the capital we import. They also benefit most from our “butter” spending habits. China is also a military power. U.S. consumption of Chinese production is threatening U.S. military superiority. Absent absolute U.S. military superiority, the current account deficit must correct. Corporate bondholders will suffer badly when this occurs. The deterioration of corporate credit fundamentals will then become apparent. Gambling on the “kindness of strangers,” especially those with ulterior motives will prove to be a bad bet. If the U.S. is able to maintain absolute military superiority, the “strangers” may discover that the value of the corporate bond they own is inferior to the same corporate bond owned by a U.S. citizen.

XXIII. Portfolio Recommendation

Corporate bond valuations are too expensive relative to their risk, so they should be avoided. Corporate treasurers should issue long-term bonds.

XXIV. Policy Recommendation

The trade deficit must be reduced quickly by a substantial amount. It is the moral responsibility of the countries with trade surpluses to change “objective functions” and implement policies that lead to a better balance of global trade. The surplus countries appear unwilling to alter their policies. The U.S. must force change. An immediate 30-40 percent decline in the U.S. dollar and/or tariffs and consumption taxes on foreign goods are required to correct the problem. In all cases, the U.S. needs to maintain military superiority and military spending should be increased.

The immediate need for a large devaluation of the U.S. dollar will serve two purposes. First, the devaluation of the currency will improve the competitiveness of exports and retard the consumption of imports. The trade imbalance should improve. Second, a large devaluation of the dollar will improve the prospect for dollar-denominated investments, especially bonds. The currency risk associated with foreign investment is eliminated. Future U.S. dollar currency appreciation can then supplement the relatively low yield of bonds. Otherwise, the improvement in the trade deficit is limited; expectations for both interest rate increases and currency devaluation dominate. There can be no tolerance for retaliatory trade actions of other countries. Retaliatory actions should be countered with the immediate implementation of a combination of trade policies and capital controls. Capital controls are required to subdue adverse price effects in the bond and currency markets.
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