

ANALYZING THE SUBPRIME MARKET FALLOUT USING EDF CREDIT MEASURES

APPLIED RESEARCH NOTE

AUTHORS

Douglas Dwyer, Ph.D.

Sarah Woo

Highlights

- Out of 210 publicly-traded real estate investment trusts (REITs) and mortgage lenders, the Moody's KMV Public Expected Default Frequency™ (EDF) model identifies several of them with a greater than 10% probability of defaulting over the next one year.
- Prior to its default on April 2, 2007, New Century Financial Corporation® (NEWC) had been materially deteriorating since 2006, when its EDF credit measure crossed the 90th percentile of its peer group.
- The EDF credit measure captured changes in NEWC's capital structure and market value of assets.
- The use of short-term warehousing credit facilities can make Mortgage REITs susceptible to significant liquidity risk during periods of rising mortgage delinquency rates.
- The EDF model incorporates market prices in the determination of credit risk. Our successful identification of troubled subprime lenders provides a good current illustration of how this works.

Copyright© 2007, Moody's KMV Company. All rights reserved. Credit Monitor, CreditEdge, CreditEdge Plus, CreditMark, DealAnalyzer, EDFCalc, Private Firm Model, Portfolio Preprocessor, GCorr, the Moody's KMV logo, Moody's KMV Financial Analyst, Moody's KMV LossCalc, Moody's KMV Portfolio Manager, Moody's KMV Risk Advisor, Moody's KMV RiskCalc, RiskAnalyst, Expected Default Frequency, and EDF are trademarks owned by of MIS Quality Management Corp. and used under license by Moody's KMV Company.

Published by:
Moody's KMV Company

To Learn More

Please contact your Moody's KMV client representative, visit us online at www.moodyskmv.com, contact Moody's KMV via e-mail at info@mkmv.com, or call us at:

NORTH AND SOUTH AMERICA, NEW ZEALAND AND AUSTRALIA, CALL:
1 866 321 MKMV (6568) or 415 874 6000

EUROPE, THE MIDDLE EAST, AFRICA AND INDIA, CALL:
44 20 7280 8300

FROM ASIA CALL:
813 3218 1160

1 TURMOIL IN THE SUBPRIME MARKET

Recent turmoil in the subprime mortgage market claimed several victims, notably New Century Financial Corporation (NEWC), which filed for bankruptcy on April 2, 2007.¹ In a review of the credit risk of a group of over two hundred REITs and mortgage lenders, we found several firms with high EDF credit measures, which is the one-year probability of default. Like NEWC, the beleaguered Novastar Financial Inc has an EDF credit measure of 20.00%. Fremont General Corp, which is exiting the subprime market following a federal cease-and-desist order, has an EDF credit measure of 19.37%.

The EDF credit measures for Fieldstone Investment Corp. and New York Mortgage Trust Inc are currently above 15%. Fieldstone Investment Corp. recently had its purchase price substantially reduced from the level in its merger agreement prior to completion of its sale and New York Mortgage Trust Inc just completed a sale of substantially all the operating assets of its retail mortgage lending platform to Indy Mac Bank on March 31, 2007. Furthermore, there are other subprime lenders with an EDF credit measure of more than 10% such as Opteum, American Home Mortgage Investment Corp and Capstead Mortgage Corp.

A look at the EDF credit measure for the group as a whole, however, reveals that credit risk has not changed much for less-risky companies, i.e., those falling within the 75th percentile and below. Clearly, market players are able to distinguish between companies holding onto subprime mortgages and those with higher-quality or highly-diversified portfolios.

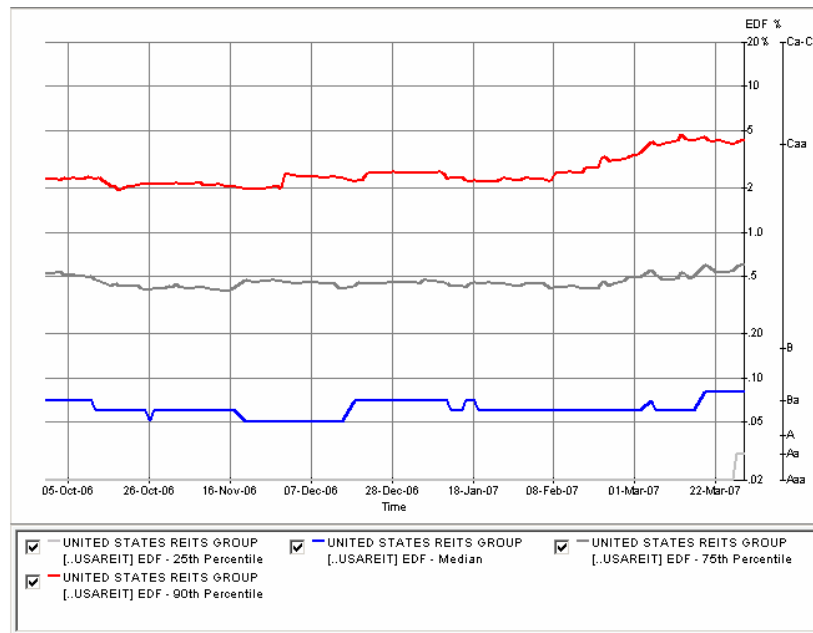


FIGURE 1 EDF Percentiles for the REITs and Mortgage Lenders Group

At the top of the 90th percentile is NEWC. From early March onwards, NEWC received cease-and-desist orders from state regulators. Its stock was removed from the New York Stock Exchange, and Fannie Mae terminated its relationship with the company. Most significant in NEWC’s spiral towards bankruptcy was its liquidity crisis, as the company received notices of default from its lenders alongside accelerated demands that it complies with mortgage loan repurchase obligations. This report provides an analysis as to how a subprime mortgage lender such as NEWC entered into default.

¹ Upon delisting, New Century Financial Corporation’s ticker changed from NEW to NEWC (or more precisely NEWC.PK).

1.1 New Century Financial Corporation on the Radar Screen Since 2006

NEWC has been on our radar screen for some time because of an elevated and ever-increasing level of credit risk. NEWC’s EDF credit measure, or one-year probability of default, rose from less than 0.2% in September 2004, to 0.5% in mid-2005. This also brought it into the 75th percentile of its peer group, which we defined as a combination of the U.S. REITs Group and U.S. Mortgage Bankers and Correspondents Group. Toward the end of 2006, it reached the 90th percentile of its peer group, with a probability of default in excess of 2%, similar to that of Caa-rated companies, and from there quickly reached our model maximum of 20%.

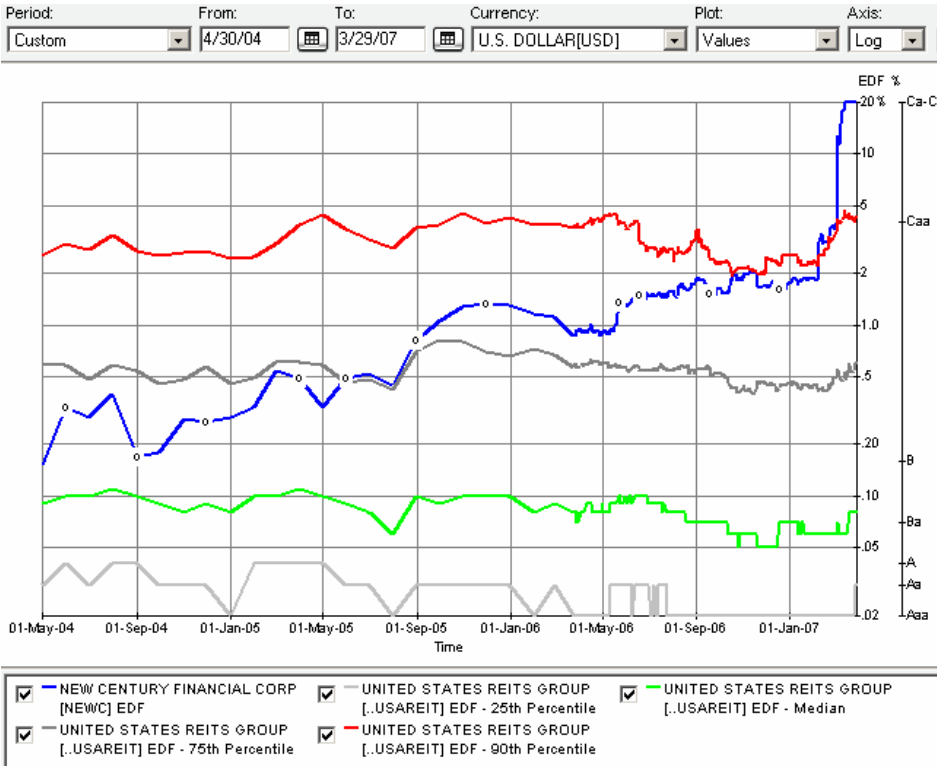


FIGURE 2 Comparing NEWC's EDF Credit Measure to its Peer Group

The responsiveness of the EDF credit measure to changes in NEWC’s circumstances provided users of the tool with an early warning of the problems that resulted in the default of the firm. As Figure 2 displays, the EDF credit measure has been worsening over time—not only in the last few weeks—and the steepness of this decline is striking. This contrasts with NEWC’s public counterparty credit rating by Standard & Poor’s, which had NEWC rated between BB and B throughout the period of this analysis according to Bloomberg, while the EDF credit measure shows that NEWC’s credit risk has been much higher than that of financial companies in the BB and B peer group since earlier in 2006. Standard & Poor’s lowered NEWC’s rating to CCC in the beginning of March 2007 when the equity markets had already drastically slashed NEWC’s market value. On March 12, Standard & Poor’s finally placed NEWC on default status. Moody’s Investors Service withdrew its B1 rating on NEWC in March 2005, when the senior convertible bond was converted into common stock.

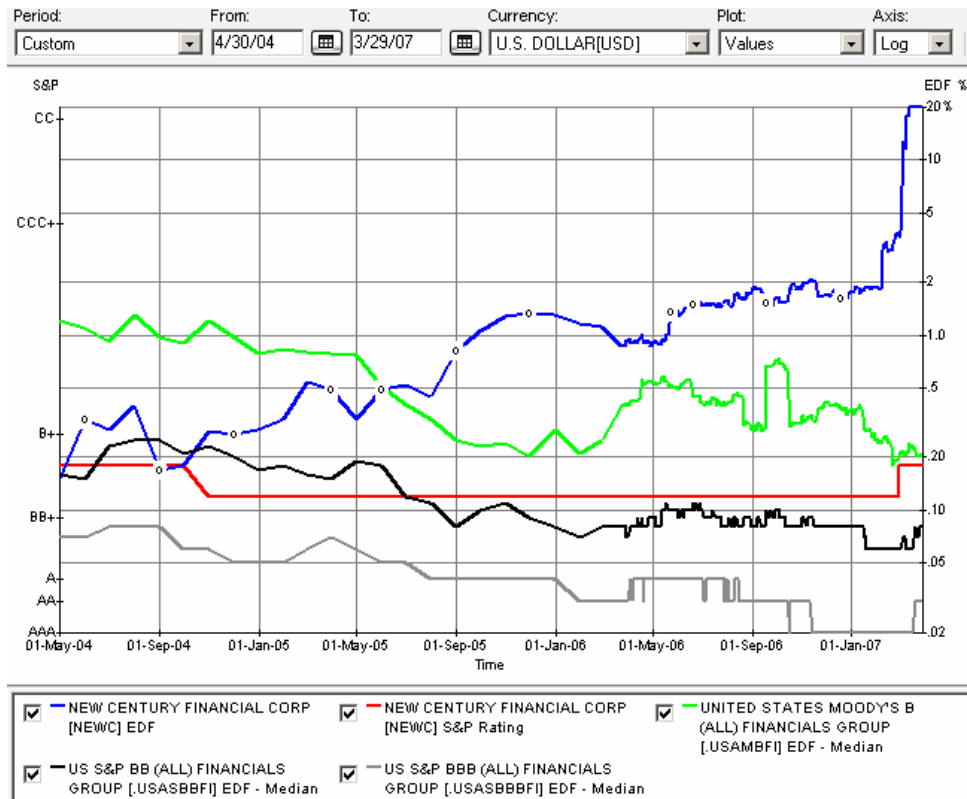


FIGURE 3 Comparing NEWC's EDF Credit Measure to the Standard & Poor's B, BB, and BBB Financials Group

Although the initial worldwide attention to NEWC was garnered by its rapidly declining stock price recently, the share price itself had not previously been indicative of NEWC's high level of credit risk (many companies have equity price shocks that do not lead them close to default). EDF credit measures do not simply reflect the changes in the equity market value of a firm. Indeed, despite the relative stability of the NEWC equity value, the EDF credit measures rose from 0.5% in June 2005 to high levels in February 2007, well in advance of the sudden collapse in the stock price in February 2007.

To understand why the EDF credit measure identified NEWC's rising credit risk in a timely fashion (i.e. in a way which gave EDF model users a chance to manage their exposure to NEWC before financial distress became a real issue), we now examine the three main EDF drivers with special regard to NEWC's particular business conditions.

- The market value of assets,
- The market leverage of the company, and
- The default point of the company.

2 CHANGES IN MARKET LEVERAGE AND ASSET VALUE

NEWC is a REIT, which focuses on originating and purchasing mortgage loans to individuals who do not satisfy the credit, documentation, or other underwriting standards prescribed by conventional mortgage lenders and loan buyers, i.e., subprime credits. Its revenues are mainly derived from interest income earned on its portfolio of mortgage loans, and from gains on sales and securitizations of these loans in the secondary mortgage market.

Typically, the cash requirements underlying such mortgage lending operations, particularly in the origination business, would be funded by borrowings under warehouse credit facilities and asset-backed commercial paper. In 2003, NEWC started to retain a portion of its loan production on its balance sheet through securitizations structured as on-balance

sheet financing. This represented a major shift in its capital structure strategy since it has historically moved the mortgage loans off its balance sheet through sales and securitizations after the warehousing stage.

TABLE 1 Excerpt from NEWC's Balance Sheet

Balance sheet data	Sep-06	Dec-05	Dec-04	Dec-03	Dec-02	Dec-01
Cash and cash equivalents	408,860	503,723	842,854	278,598	176,669	100,263
Restricted cash	572,847	726,697	454,035	116,883	6,255	6,416
Mortgage loans held for sale	8,945,134	7,825,175	3,922,865	3,422,211	1,920,396	1,011,122
Mortgage loans held for investment	14,030,999	16,143,865	13,195,324	4,745,937	—	—
Residual interests in securitizations	223,680	234,930	148,021	179,498	246,964	306,908
<i>Total assets</i>	<i>25,059,768</i>	<i>26,147,090</i>	<i>19,051,944</i>	<i>8,943,938</i>	<i>2,402,928</i>	<i>1,451,318</i>
Credit facilities on mortgage loans held for sale	8,487,850	7,439,685	3,704,268	3,311,837	1,885,498	987,568
Financing on mortgage loans held for investment	13,858,940	16,045,459	13,105,973	4,686,323	—	—
Convertible senior notes	—	4,943	5,392	204,858	—	—
Subordinated debt	51,545	—	—	—	—	40,000
Residual financing	—	—	—	—	—	79,941
Other liabilities	597,084	547,303	357,746	198,909	130,880	96,048
<i>Total Liabilities</i>	<i>22,995,419</i>	<i>24,037,390</i>	<i>17,173,379</i>	<i>8,401,927</i>	<i>2,016,378</i>	<i>1,203,557</i>
<i>Total stockholders' equity</i>	<i>2,064,349</i>	<i>2,109,700</i>	<i>1,878,565</i>	<i>542,011</i>	<i>386,550</i>	<i>247,761</i>

Source: SEC Filings.

This move increased NEWC's leverage position, because a significant portion of these on-balance sheet securitized bonds (REMICs and CMOs) were due within one year. In 2005, the current portion of the securitized bonds was 32%, which rose to 37% for the nine months ended September 2006, according to NEWC's last 10-Q filing. See Table 1 for an excerpt from NEWC's balance sheet.

In addition to the gradual shift in capital structure and leverage of NEWC, market conditions started to turn for the worse for NEWC. In their 10-Q filing in September 2006, the company explicitly discussed difficulties faced in its operations, stating that "the first nine months of 2006 have been challenging for originators of mortgage loans... We expect our loan production volume to be moderately lower than the third quarter and our non-prime net operating margin to be reduced in the fourth quarter as a result of higher discounted loan sales. Additionally, we expect mortgage loan portfolio income to be lower than the third quarter as the portfolio balance continues to decline."

This situation is borne out in NEWC's earnings, where the net earnings for Q306 suffered a steep year-on-year decline of 45%. Furthermore, NEWC had not been able to complete any securitizations structured as sales and, since June 2006, NEWC did not enter into any new securitizations structured as financing. Instead, NEWC had been undertaking whole loan sales, including discounted loan sales (i.e., mortgage loans sold at a discount to their outstanding principal balance) on the secondary market. In the first nine months of 2006, they sold \$916.3 million in discounted loans, of which more than half were repurchased and rejected loans.

In terms of the EDF model, the above translates into a fall in the market value of NEWC's assets since 2006 (calculated using our option-theoretic Vasicek-Kealhofer model, and reflecting the market's changing view of the present value of its

cash flows) and a rise in its market leverage since 2004 (defined as the combination of short- and long-term liabilities that cause a company to default over a one-year horizon divided by the market value of assets). This is evidenced in the EDF model as rising credit risk since 2005.

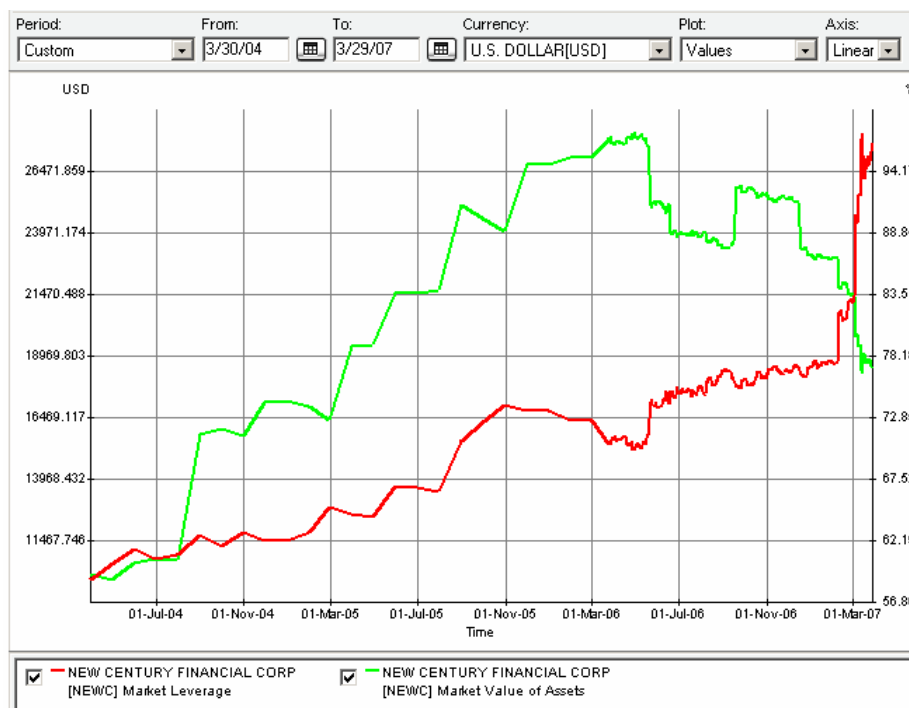


FIGURE 4 NEWC's Market Leverage and Market Value of Assets

3 THE IMPACT OF RISING MORTGAGE DELINQUENCY RATES

Problems in the subprime market have mainly been driven by fears of continued decline in credit quality, in terms of higher delinquencies and losses upon foreclosures as well as lowering origination volumes. A downward spiral then began as each negative market development fueled a deterioration in key fundamentals, such as volume and pricing, and most importantly, funding.

Changes in the availability of funding posed the greatest risk to mortgage REITs, such as NEWC, which have enormous needs for short-term liquidity to remain operational. Funding is by and large dependent on mainstream lenders' perceptions of the market value of the REIT's assets. This suggests that the credit risk of a mortgage REIT would bear a sensitive relationship to the market valuation of its assets. The following elaborates on how a destructive combination of a turn in market conditions, declining asset values, and a liquidity crisis played out in NEWC, culminating in its recent bankruptcy.

Turn in Market Conditions

The Mortgage Bankers Association recently stated in its quarterly report that the late-payment (payments 30 days past due) rate jumped to 13.3% for subprime loans and to 14.4% for subprime adjustable-rate mortgages in the fourth quarter. This was the highest late-payment rate in four years. This development, coupled with fears of falling housing prices (unlike the situation four years ago) reducing recovery values, caused ripples through the subprime market.

Declining Market Value of Assets

As a result of higher delinquencies, foreclosures and expected losses upon foreclosure, NEWC initially suffered a decline in income on its portfolio of mortgage loans retained on the balance sheet. Next, a drastic fall in demand on the secondary markets for subprime mortgage credit (as reflected in precipitous drops in the ABX-HE-BBB- 07-1 and similar indices) resulted in NEWC suffering losses in terms of proceeds received from loan sales. In addition and as discussed earlier, the company was unable to complete any securitizations in the secondary market for the past year. Also, the asset value of residual interests which NEWC retained from the off-balance sheet securitizations, i.e., the equity tranche, would have declined over this period.

The cumulative effect of the above developments was a general decline in the market value of NEWC's assets. Furthermore, NEWC faced an increase in repurchase obligations from buyers of the loans and from bondholders in the securitizations, as a result of early payment defaults (an obligation triggered where a payment default by the underlying borrower occurs during a certain period of time following the sale or securitization). See the following sample clause of an early payment default clause.

Sample Clause in relation to Substitution or Repurchase Obligations for Delinquent Loans: “[Company] will have the obligation to repurchase or substitute any mortgage loan from the trust if the first scheduled payment due subsequent to the cut-off date is not made within sixty days of the related due date, subject to certain notification requirements set forth in the assignment and assumption agreement. Any repurchases may shorten the weighted average lives of the offered certificates.”

However, the repurchase obligations discussed above were not the primary cause of NEWC having to seek bankruptcy protection. As is so often the case it was an inability to fund its operations, a collapse in available liquidity, that was the trigger for failure. NEWC was unable to meet its repurchase obligations under its warehouse credit facilities. In its recent 8-K filing in March 2007, NEWC clarified that its repurchase obligations under warehouse credit facilities were approximately \$8.2 billion, in addition to which purchasers of whole loans had submitted claims for the repurchase of approximately \$0.5 billion, as a result of early payment defaults and breaches of representations and warranties.

The Liquidity Crisis

NEWC and its subsidiaries had historically maintained warehouse credit facilities with large banking and investment institutions to finance the purchase and retention of loan mortgages. These facilities had been structured as sales of mortgage pools with a simultaneous agreement to repurchase the loans at a later date. These are not considered true sales because NEWC did not surrender control of the transferred assets, i.e., it was entitled and obligated to repurchase the assets prior to their maturity. As such, these are substantively short-term borrowings with mortgage loans as collateral. In return for passing the loans onto warehouse lenders such as Morgan Stanley and Citigroup, NEWC obtained cash equal to the value of the assets, with a haircut to protect and compensate the lenders.

These warehouse credit facilities posed a significant liquidity risk to NEWC during times of decreasing collateral values. To the extent a lender determined that the value of the portfolio of mortgage loans had decreased, it had the right to initiate a margin call requiring NEWC to either provide additional collateral or to repay a portion of the outstanding borrowings. A failure to meet a margin call is typically an event of default, so the lender would have been entitled to accelerate NEWC's obligations to repurchase the mortgage loans immediately. Once NEWC defaulted under any of its warehouse credit facilities, the other lenders could demand immediate payment of all outstanding amounts pursuant to cross-default provisions.

It is interesting to observe how easily a margin call can be made, in terms of strict legal entitlement, in a subprime market with deteriorating credit quality, leading to a liquidity crisis. In many cases, the change in value of mortgage loans underlying a margin call essentially depends on a judgment call by lenders. The broad discretion given to lenders in relation to valuation is reflected in clauses defining the market value of mortgage loans to be “the value ascribed to such asset by the Buyer in its sole discretion exercised in good faith.”

4 THE CHALLENGE FOR MORTGAGE REITS: LIQUIDITY RISK

Given the risks posed by warehouse credit facilities, why do mortgage REITs such as NEWC often rely on them? The main answer to this may lie in the legal structure of a REIT, which is a defined legal structure that is required to distribute at least 90% of taxable income to stockholders to comply with the REIT provisions of the Internal Revenue Code and to be exempt from corporate taxation. This means that little retained earnings can be generated to grow the REIT's business. Mortgage REITs are thus highly dependent on financing facilities to acquire and hold mortgage loans pending sale and securitization.

The susceptibility of subprime mortgage REITs to liquidity risk is not a recent occurrence. In the liquidity crisis of 1998, the most severe problems were encountered by mortgage REITs. Some mortgage REITs which experienced financial distress during that period subsequently shed the REIT structure, e.g., IndyMac Bank converted into a thrift to diversify its financing sources. More recently, another mortgage REIT under stress, Homebanc Corporation, elected not to operate the company as a REIT starting in 2007 to implement changes in its capital structure.

In this context, we can conclude that the relationship between a mortgage REIT's liabilities and the value of its assets is such that its credit risk is highly sensitive to the market valuation of its assets. Figure 5 illustrates how the EDF credit measure reacted sharply to the plummeting stock price of NEWC.

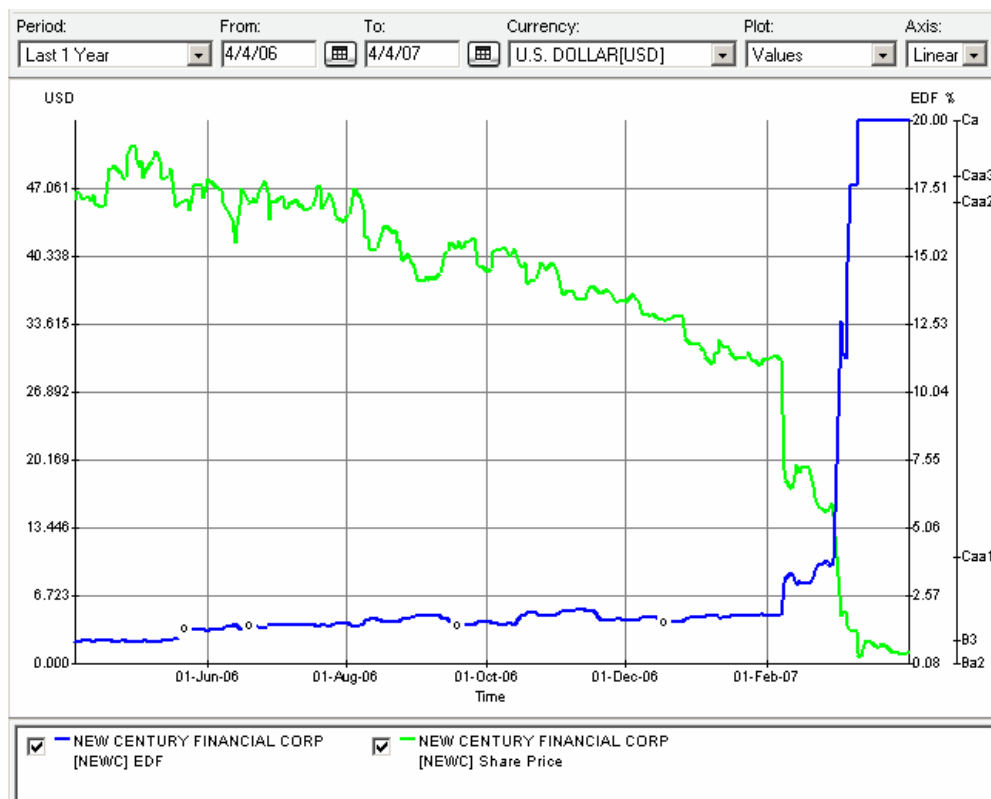


FIGURE 5 Using Equity Data as an Input to Calculate Probabilities of Default

This means that a good approach for any individual lender or investor to determine the credit risk of mortgage REITs would be to incorporate market prices which embody the synthesized appraisals of many investors. The EDF model and methodology effectively achieves this by providing, through our Vasicek-Kealhofer model, firstly a method of calculating the market value of the assets, and secondly of calibrating their market leverage, normalized by volatility, to actual default probabilities.

5 LOOKING FORWARD

As turmoil in the subprime market continues, we are faced with more interesting questions. For example, what is the impact of pressures in the mortgage market on the credit risk of non-REIT lenders such as Countrywide Financial and Washington Mutual, which have significant subprime exposures? With some subprime mortgage REITs, such as Accredited Home Lenders or Novastar Financial appearing to be attractive acquisition targets, how do we measure the potential post-buyout credit risk? Using Moody's KMV EDF tools for peer group and sector analysis, we will expound on these issues separately in a note or webinar shortly.