

The Bear in the OC:

An Analysis of Bear Stearns Residential Mortgage Lending In Orange County, California

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Executive Summary

We analyze the mortgage lending of Bear Stearns' residential mortgage subsidiary, EMC Mortgage Corporation (EMC), based on publicly available data provided to investors in their mortgage-backed securities. We estimate that EMC funded at least 24,051 residential mortgage loans totaling \$13.2 billion in Orange County, California, over the 2003-2007 period studied and that the majority of these were so-called "Alt-A", rather than prime or subprime loans. Moreover, the majority of these loans were reduced documentation loans with interest-only contract features. In addition to describing the data and the distribution of lending by city across Orange County, we develop a simple model to explain the high levels of default occurring among these loans.

1. Introduction

The current financial crisis originated with large and unexpected losses on mortgages and mortgage-backed securities. Among the precipitating events in the crisis were, first, the collapse of two Bear Stearns sponsored hedge funds in August 2007, followed by collapse of Bear Stearns itself in March 2008¹.

Among the most active of the Wall Street firms in the residential mortgage market, Bear Stearns originally incorporated EMC Mortgage in 1990 as a wholly-owned mortgage banking subsidiary to facilitate the purchase and servicing of whole loan portfolios. Beginning in 2001, EMC expanded its business to acquire newly originated Alt-A loans through a conduit program; in 2003, the conduit was expanded to purchase newly originated subprime loans. Loans were generally purchased with the ultimate strategy of securitization into an array of Bear Stearns securitizations.

Innovation in the design and underwriting of mortgages has been blamed for at least part of this market collapse, producing increased interest in both borrower and lender behavior during the run-up. Here we focus on the lending activities of EMC in Orange County, California. Like many other parts of the country, Orange County experienced very rapid increases in house prices up until mid-year 2006, after which prices dropped substantially. EMC's lending practices have been criticized and in late 2008 the company reached a settlement with the Federal Trade Commission².

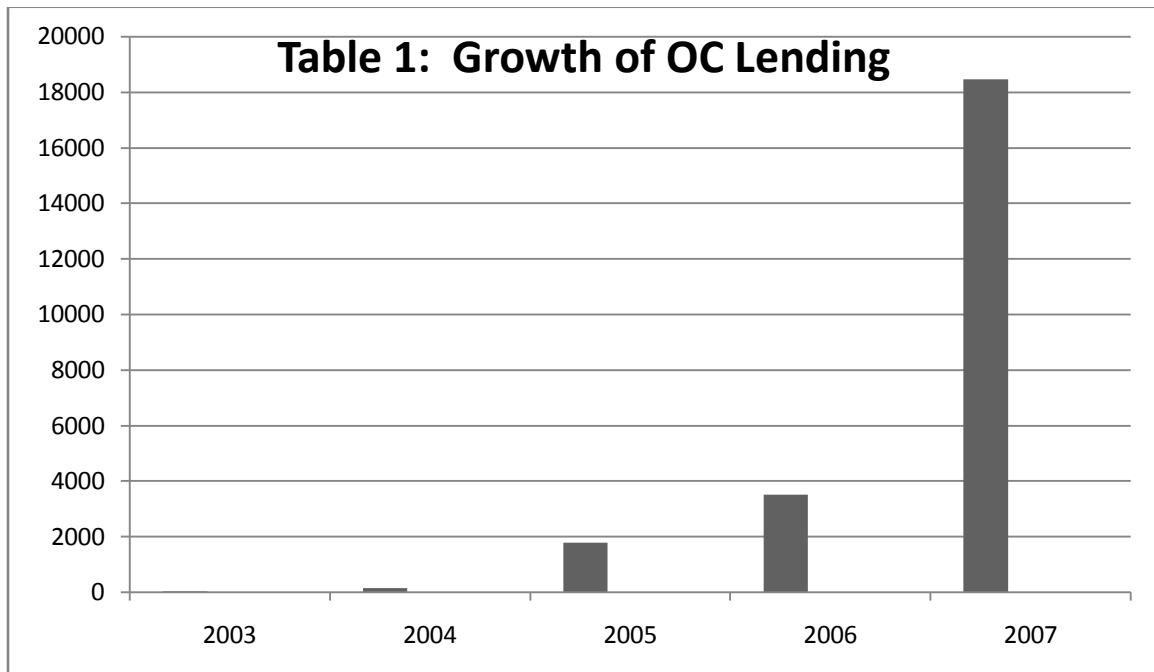
¹ After its collapse, Bear Stearns was sold to JPMorganChase with the intervention of the Department of the Treasury and the Federal Reserve Board, which absorbed some of their non-performing assets.

² The Bear Stearns Companies, LLC and its subsidiary, EMC Mortgage Corporation, agreed to pay \$28 million to settle Federal Trade Commission charges that they engaged in unlawful practices in servicing consumers' home mortgage loans. The companies allegedly misrepresented the amounts borrowers owed, charged unauthorized fees, such as late fees, property inspection fees, and loan modification fees, and engaged in other unlawful and abusive collection practices (Source: www.ftc.gov).

Based on the Case-Shiller seasonally adjusted repeat sales index that includes both Los Angeles and Orange Counties, house prices peaked in May 2006 and had declined by approximately 35% percent as of October 2008.

2. Overview of EMC Lending in Orange County

Table 1 below shows the dramatic growth of loans originated in Orange County over the five-year time period 2003-2007.



From a base of almost zero, the number of loans made in each increased dramatically to over 18,000 in calendar year 2007, even though the housing market downturn, by most measures, had begun in mid-year 2006.

This pattern of growth is consistent with EMC's business model of using mortgage brokers and other third parties to source new loan volume.

3. Loan Characteristics

Table 2 below shows the mix of lending: prime, subprime, and Alt-A, including all loans for which data is available. Also shown are key characteristics of each loan type, including the mean loan amount, the mean FICO score of borrowers, and the mean cumulative loan-to-value ratio (CLTV) at origination. CLTV includes the effect of any junior lien financing; e.g. a property financed with an 80% first lien and a 10% second lien would have CLTV of 90% of property value.

Table 2: Loan Type	Number	Average Loan Amount	Average FICO	Average CLTV
Prime	218	\$495,500	728	69
Subprime	1,111	\$373,573	641	79
Alt-A	22,722	\$558,546	713	83

Clearly, the substantial majority of EMC's lending in Orange County was Alt-A lending and those loans were, on average, quite large, well-above the maximum conforming loan limit of \$417,000 prevailing during most of the time period studied. Average credit scores and original cumulative loan-to-value ratios (CLTV) are similar to those reported for these loan types: Alt-A loans are somewhat riskier than prime loans, as evidenced by the lower average credit score and higher average CLTV; however, credit scores are substantially higher than those of subprime borrowers.

All loan types shown appear to be non-conforming: prime and Alt-A due to loan size; subprime due to credit quality issues. Without more detailed information, it is not possible to determine what fraction of these loans might have been eligible for purchase by the government-sponsored enterprises, Fannie Mae and Freddie Mac. This is consistent with EMC's business model of focusing on the non-conforming loan market, as opposed to conforming conventional or government-insured segments.

A number of other loan characteristics are available in the data set and we not analyzed all of these in detail; however, several additional characteristics are of worthy of note. First, the majority (72%) of the loans made were for refinancing purposes, rather than for home purchase. In addition, the majority (90%) of loans were adjustable rate instruments, rather than traditional fixed rate mortgages. Such loans subject borrowers to potential payment shock if rates re-set higher and some argue that these loans are at greater risk of default (see, for example, Standard and Poors, March 26, 2008). Finally, the majority (88%) of loans contain prepayment penalties. Prepayment penalties, while valuable to investors, make it more costly for borrowers to refinance and some have argued that they "trap" borrowers in unsuitable loans, thereby further increasing default risk.

4. Geographic Distribution

Table 3 below shows the cities in Orange County receiving the largest number of EMC loans over the period studied. Cities with 500 or more loans are specifically identified; those with fewer are grouped into an all-other category.

TABLE 3: CITIES WITH LARGEST NUMBER OF LOANS		
	<u>Count</u>	
ANAHEIM	2,141	
SANTA ANA	1,827	
IRVINE	1,509	
HUNTINGTON BEACH	1,415	
MISSION VIEJO	1,311	
ORANGE	1,045	
LAKE FOREST	1,027	
GARDEN GROVE	1,018	
FULLERTON	1,005	
LAGUNA NIGUEL	784	
ALISO VIEJO	778	
NEWPORT BEACH	771	
RANCHO SANTA MARGARITA	730	
TUSTIN	622	
LA HABRA	577	
YORBA LINDA	560	
SAN CLEMENTE	548	
BUENA PARK	527	
WESTMINSTER	500	
TOTAL	18,695	
ALL OTHER CITIES	5,356	
GRAND TOTAL	24,051	

No obvious geographic pattern is evident in the distribution of lending across cities. The cities receiving the largest number of loans tend to be the largest cities in the county by population, such as Anaheim and Santa Ana. The bivariate correlation of the number of loans to the city population (as of 2005) is 0.90, confirming this simple relationship.

5. Loan Performance

Across all loans, the overall foreclosure rate was 5.4% as of mid-year 2008; however, many loans are quite new (originated in 2006-2007) and may not have reached peak default risk period yet, generally thought to occur during years two or three. To facilitate comparison across types, Table 4 below shows foreclosure rates by loan type for loans at least 12 months old as of the measurement date.

Table 4	
Loan Type	Foreclosure Rate
Prime	11.0%
Subprime	21.0%
Alt-A	11.4%
Total	12.9%

While the normal pattern of higher default rates among subprime loans is evident here, default rates are very high across all loan types and the difference between Prime and Alt-A loans is minimal.

To help explain the performance of these loans, a simple statistical model of loan performance was estimated. This model, a logistic regression, can isolate individual factors that are most highly related to the foreclosure outcome. Results are shown in Table 5 below.

Table 5		
Risk Factor	Direction of Effect	Magnitude
Age of loan	Positive	NA
Loan amount	Negative	NA
Borrower credit score	Negative	NA
Cumulative LTV	Positive	NA
Loan is a second lien	Negative	NA
Loan is graded Prime	Negative	0.43
Loan is graded Subprime	Positive	1.02
Low doc loan	Positive	1.22
Interest-only loan	Positive	1.87

Based on the analysis above, older loans, smaller loans, loans to borrowers with lower credit scores, and loans with higher cumulative loan-to-value ratios all had higher default probabilities. These results are consistent with most economic studies of mortgage default risk. Relative to Alt-A loans, Subprime loans were 1.02 times more likely to default; Prime loans were 43% as likely to default (57% less likely to default). Among specific risk factors, low doc loans were 1.22 times as likely to default and interest-only loans were 1.87 times as likely to default. Somewhat surprisingly, loans that were second liens had lower default risk than other loans; however, this is a very small set of loans and may have subject to more stringent underwriting requirements.

6. Summary and Conclusions

In this study, we have briefly examined the residential lending patterns of loans funded through Bear Stearns EMC Mortgage Corporation in Orange County, California, over the period 2003-2007. We have shown that the company appears to have focused on large size Alt-A loans, especially those with minimal documentation and interest-only features. Compared to national benchmarks, the performance of these loans is quite poor, with high default rates across all loan categories. For example, based on the Mortgage Bankers Association Quarterly Mortgage Delinquency Survey, the overall foreclosure rate was 2.75% as of the second quarter of 2008, 1.4% for prime loans and 11.8% for subprime loans (Alt-A loans not broken out). It appears that the combination of low-doc and interest-only features contributed to the relatively high foreclosure rates experienced, no doubt contributing to the collapse of the parent firm in 2007 and the ensuing mortgage and financial crisis of 2007-2008.

Foreclosures have negative effects on the communities in which they occur, too. In other research using Orange County, California data, we have estimated that a 1% increase in the foreclosure rate in the local area is related to a 0.4% decrease in the sales price of non-foreclosure properties in the same neighborhood. Colloquially speaking, foreclosure sales drag down property values of other homes nearby. Moreover, the reduced property tax basis impairs local government property tax revenues, potentially affecting services.

The costs of these poor borrowing and lending decisions are likely to be borne by Orange County communities for years to come.

Appendix: Data and Methodology

The main source of data used in this study is the EMC Mortgage Corporation web site: www.emcmortgagecorp.com. From this site we obtained information on the company and downloaded detailed loan level files with information on all loans contained in mortgage-backed securities issued by Bear Stearns, more than 300,000 loan level records in total. We also read rating agency reports posted on the web site which provided additional company background. Contained among the data fields is collateral property zip code, which we then matched to a list of zip codes in Orange County, California, to identify loans geographically. City name is also available, allowing the analysis shown in Table 3.

Additional data elements facilitated the comparisons shown in other tables. The data element “product type” characterized each loan as Prime, Subprime, or Alt-A. CLTV and FICO score were also available. Identification of low-doc loans is slightly more complicated. The data contained fields for “front housing ratio” and “ttl debt ratio” which appear to provide the so-called “front end” and “back end” payment ratios. These fields contained normal sorts of values, e.g. a 25% mortgage payment ratio and a 30% total debt-to-income ratio. We infer that loans with those data elements missing are low-doc loans; such loans would generally be referred to as NINA (no-income, no-asset) loans, which may be distinguished from “stated income” loans, a distinct category of low-doc lending which we have not yet developed a method to identify.

Loan performance measurement is likewise indirect. We infer from the assignment of a foreclosure attorney (from the data element “FC attorney name”) that the loan has entered the foreclosure process but cannot determine the exact current status of the loan as of the measurement data nor, of course, the ultimate disposition of the property. There are additional data elements related to delinquency and REO status that we have also not yet de-coded.

We attempted to contact representatives of EMC Mortgage to confirm our interpretation of various data elements but phone calls and email messages were not returned. We have also been in contact with representatives of JPMorganChase (the new owner of Bear Stearns and, hence, EMC Mortgage). Those individuals were generally helpful but not familiar with the data to the degree of detail we needed for purposes of this analysis, so we have been forced to make numerous assumptions in completing this study. We hope to improve our understanding of the data and conduct more complete analyses in the future.

The pages following show a list of the mortgage-backed securities for which we downloaded data and the entire list of data elements. Also included is an excerpt from a ratings agency report on EMC.

Table A-1 Largest MBS Issues Used for Analysis
(Others had fewer than 50 OC loans)

<u>Deal Name</u>	<u>Number of OC Loans</u>
SAMI07AR7	11,386
SAMI07AR5	3,931
SAMI07AR4	2,273
SAMI07AR2	355
GMTA06AR1	333
SAMI07AR3	320
BSMF06AR5	242
SAMI06AR4	238
SACO200607	175
BSSLT071	158
SACO200601	150
BSMF07AR4	147
SACO200608	136
BSMF06AR2	121
BSMF06SL6	114
BSABS07HE7	113
BSMF07SL1	111
BSABS06H10	104
BSMF06AR1	104
SAMI06AR7	101
BSMF06AR3	88
BSMF07AR2	81
BSABS07HE3	76
GMTA05AR4	73
SACO200605	71
BSMF06SL4	66
GMTA06AR3	66
BSMF06AR4	51

Table A-2: Data Elements

AMORT_TERM
AMORT_TYPE
ARM_FIRST_PMT_CHG_DATE
ARM_FIRST_RATE_CHANGE
ARM_FLOOR
ARM_INDEX
ARM_INDEX_CODE
ARM_IR_CHG_PERIOD
ARM_IR_RATE_MAX
ARM_LIFE_CAP
ARM_MAX_NEG_AMORT_PCT
ARM_NEG_AMORT_FLAG
ARM_NEXT_PMT_CHG_DATE
ARM_ORIG_PI_PMT
ARM_ORIG_RATE
ARM_PI_CHANGE_MAX
ARM_PI_CHG_PERIOD
ARREAR_COLL
AUS_DOC_TYPE
BALLOON_FLAG
BEG_ACTUAL_BAL
BEG_ARREAR_BAL
BEG_S_BAL
BK_CHAPTER
BPO_TYPE
BPO_VAL
C_BPO_DATE
C_BPO_VALUE
CASH_FLOW_GROUP
CLTV_ORIG
CONTRACT_RATIFIED_DATE
CONTROL_NO
CONVERTIBLE_FLAG
CURR_CAT
CURRENT_BAL
CURRENT_IPTD
CURT_ADJ_COLL
CURT_ADJ_REMIT
CURT_COLL

CURT_REMIT
CUTOFF_DT
DAYS_AS_REO
DEAL_NAME
DEF_BAL
DELQ_SERV_FEE
DELQ_STATUS_CODE
DEMAND_LETTER_DATE
DISCHARGE_DATE
DISMISSAL_DATE
DOC_CODE
DQ_COUNTER
DQ_TIMES_30_IN_12
DQ_TIMES_60_IN_12
DUE_DATE
END_ACTUAL_BAL
END_ADV_BAL
END_ADV_INT_BAL
END_ADV_PRIN_BAL
END_ARREAR_BAL
END_SCHED_BAL
EOM_END_S_BAL
ESCROW_ADV_BAL
ESCROW_BAL
ESCROW_PMT
EVICT_COMPLETION_DATE
EVICT_REQUEST_DATE
EXCESS_ARREARS
EXPENSE
FB_DUE_DATE
FB_END_DATE
FB_PMT_AMT
FB_START_DATE
FC_ATTORNEY_NAME
FC_DATE_TO_ATTORNEY
FC_EST_SALE_DATE
FILING_DATE
FORCLOSURE_SALE_DATE
FORCLOSURE_TYPE_CD
FORECLOSURE_START_DATE
FRONT_HOUSING_RATIO

GR_INT_COLL
GR_INT_RATE
GROSS_MARGIN
GROSS_PRC
HEARING_CONFIRM_DATE
INSURANCE_COSTS
INT_REMIT
INVESTOR
IO_EXP_DATE
IO_FLAG
IO_PERIOD
LAST_FICO_DATE
LAST_FULL_PMT_DATE
LAST_PMT_AMT
LATE_CHARGE_AMT
LEGAL_ACTION_DATE_1ST
LIEN_POSITION
LIQ_DATE
LIQ_PRIN
LOAN_PURPOSE_CODE
LOAN_TYPE
LQD_TYPE
LTV_CURRENT
LTV_ORIG
MAN_CODE
MATURITY_DATE
MI_CLAIM_FILED_DATE
MI_CODE
MI_COVERAGE_PCT
MI_LENDER_PAID_FEE
MI_PREMIUM
MI_RATE
MIP_PMI_ADV
MOD_FLAG
MODIFIED_DATE
MOTION_FOR_RELIEF_DATE
MREC_BAL
MTG_GROUP
NET_INT_COLL
NET_INT_FUNDED_T62F
NET_INT_NOT_ADV

NET_INT_RATE
NEXT_RATE_ADJ_DATE
NON_REC_CORP_ADV
NOTE_DATE
ORIG_APPRAISAL_DATE
ORIG_APPRAISAL_VALUE
ORIG_CAT
ORIG_FICO
ORIG_OCCUPANCY
ORIG_PRIN_BAL
ORIG_TERM
PEND_INDEX
PEND_RATE
PI_ADV_BAL
PMT_DUE_DATE_1ST
POST_PETITION_DUE_DATE
POST_PETITION_PLAN_PMT
PPP_HARD_SOFT
PPP_HARD_SOFT_TERM
PPP_WAV_AMT
PPP_WAV_REASON
PREFUNDED_DATE
PREPAY_PENALTY
PREPAY_PENALTY_FLAG
PREPAY_PENALTY_TERM
PRIN_COLL
PRIN_DRAW_RMT
PRIN_NOT_ADV
PRIN_REMIT
PROCESS_STOP
PRODUCT_TYPE
PROP_CITY
PROP_PRESERVATION_COSTS
PROP_STATE
PROP_TYPE
PROP_ZIP_CODE
REC_CORP_ADV
REMIT_AMT
REO_ACTUAL_NET_PROCEEDS
REO_BROKER_COMMISSION_AMT
REO_BROKER_COMMISSION_PCT

REO_COMMENTS_CD
REO_CURRENT_LST_PRICE
REO_ESTIMATED_CLOSE_DATE
REO_LST_BROKER
REO_LST_DATE
REO_REDEMPTION_DATE
REO_SALE_PRICE
REO_SELL_DATE
REO_SETUP_DATE
REO_VALUATION_DATE
REO_VALUE
REPUR_REASON_CD
RESTRICTED_ESROW_BAL
SCHED_ARREARS
SCHED_GR_INT
SCHED_PI
SCHED_SERV_FEE
SELL_PRICE
SENIOR_LIEN_BAL
SERV_F_COLL
SERV_FEE
SERVICING_TRANSFER_DATE
SS_DIFF
SS_FLAG
SS_OLD_PI
SS_OLD_RATE
STOP_ADV_DATE
STOP_ADV_FLAG
SUSPENSE_BAL
TAX_ADV
THIRD_PARTY_BAL
THIRD_PARTY_CORP_ADV
TRANSFER_TAX
TRUST_LOSS
TTL_DEBT_RATIO
TTL_PITI
UNRMT_COLL_INT

Appendix - Excerpt of rating agency report on EMC Mortgage from 2007:

DBRS Oct 25, 2007 EMC Mortgage Corporation – Issuer Profile

"Since its inception in 1990, EMC has actively purchased re-performing and sub-performing residential whole loans (scratch and dent) and servicing rights. Consequently, EMC is one of the largest U.S. purchasers of scratch and dent mortgages from various institutions, including banks, mortgage companies and thrifts. In 2001, EMC expanded its purchase strategy to newly originated Alt-A loans through the conduit platform by which loans are purchased on both a bulk and flow delivery basis. In 2003, the conduit was expanded to purchase newly originated subprime loans. Loans are generally purchased with the ultimate strategy of securitization into an array of Bear Stearns securitizations based on product type and credit parameters, including those where the loan has become re-performing or cash-flowing."

Source: www.DBRS.com