

ARREARS AND POSSESSIONS FORECASTING MODEL – INTRODUCTION APRIL 2008

FORECASTING UK ARREARS AND POSSESSIONS

INTRODUCTION

The forecasting model developed for Acadameetrics by Dr Stephen Satchell and Baron Chan at the University of Cambridge takes macroeconomic forecasts and predicts the resulting arrears and possessions at the level of the CML UK statistics. The model is flexible and allows lenders to evaluate the results of other scenarios. In this introductory paper, prepared in June 2007, we show the UK arrears and possessions expected to arise under five alternative scenarios.

Historic UK Recession Scenarios

- UK Recession 1973-1975 – a “mild” recession as described in our complimentary Understanding Downturn Default (UDD) publication
- UK Recession 1989-1991 – a “1 in 25 year” housing crisis, relevant to lenders, typical of a Pillar 1 “gross stress test” and fully described in UDD

Illustrative Scenarios

- Severe Shock – a possibly foreseeable “worst case” downturn
- Benign Scenario – relatively static and favourable macroeconomics
- Average Scenario – “long run average” macroeconomics

The Arrears and Possessions Forecasting model is updated annually during May upon publication of the updated annual UK macroeconomic statistics, and provides UK level default data illustrated below, under the above scenarios. Subscribers to the output service may opt for results under their own capital economic forecast scenarios and under scenarios applicable to their Pillar 2 Basel scenario tests.

Subscribers to the Arrears and Possessions model forecasting service can receive a full explanation of the model and of its input variables and outputs.

MODEL OUTPUT SUMMARIES

1. UK Recession 1973-1975

1.1 Macroeconomic Environment: this scenario was characterised by high inflation and a high interest rate, a slow down in the rate of house price growth, a low unemployment rate and “high” affordability (i.e. a large fraction of disposable income was used to repay a mortgage). However the median LTV was also very low.

Macroeconomic Indicators							
	Possession (% of total mortgages outstanding)	Inflation (%)	Growth of House Price (factor)	Unemployment (%) of workforce)	Affordability	First Time Buyers Median LTV (%)	Arrear (6-12 months) (% of total mortgages outstanding)
1973	0.03	9.13	0.30	2.10	0.87	84.00	0.26
1974	0.07	15.94	0.11	2.00	0.89	84.00	0.36
1975	0.10	24.05	0.08	2.90	0.75	86.17	0.33

1.2 Forecast Results

Satchell/Chan Forecasting Model - Input						
	Inflation (%)	Growth of House Price (factor)	Unemployment (% of workforce)	Affordability	First Time Buyers Median LTV (%)	Arrear (6-12 months) (% of total mortgages outstanding)
Average Implied	16.37	0.16	2.33	0.84	84.72	0.32
Extreme Implied	9.10	0.08	2.90	0.89	86.17	0.36
					88.33	0.32

Satchell/Chan Forecasting Model Output									
Version 1 - Based on 2006 figures, forecast 2007, 2008, and scenarios in 2009									
Mortgage Possession (% of Total Mortgages)									
	2005	2006	2007	2008	2009				
					Average		Extreme		
					Actual	Implied	Actual	Implied	
(a) Regression with intercept	0.09	0.15	0.09	0.19	0.09	0.06	0.10	0.10	
(b) The intercept is significant in this regression *									
(c) Restricted Least Square	0.09	0.15	0.15	0.34	0.13	0.10	0.15	0.10	
Version 2 - Based on 2005 figures, forecast 2006, 2007 and 3 scenarios in 2008									
Mortgage Possession (% of Total Mortgages)									
	2004	2005	2006	2007	2008				
					Average		Extreme		
					Actual	Implied	Actual	Implied	
(a) Regression with intercept	0.05	0.09	0.10	0.17	0.09	0.06	0.10	0.10	
(b) The intercept is significant in this regression *									
(c) Restricted Least Square	0.05	0.09	0.14	0.32	0.13	0.10	0.15	0.15	

* see text in bold below

1.3 Explanation: in Version 1 of the forecast, we forecast the mortgage possession rates in 2007 and 2008, based on the figures available for 2006. The forecast mortgage possession in 2007 is estimated with the available LTV_FT and Arrear figures in 2006, whilst the forecast mortgage possession in 2008 is estimated with the predicted LTV_FT and Arrear figures in 2007 which, in turn, depend on the available macroeconomic variables for 2006. The forecast mortgage possession in 2009 under this scenario is estimated using the macroeconomic variables for the scenario listed above.

The term "Average" means that we use the 3-year arithmetic average of the variables given under this scenario to forecast mortgage possession in 2009. The term "Extreme" means that we pick the worst situation i.e. we use the lowest inflation, the lowest house price growth rate, the highest unemployment, the highest affordability index and the highest LTV_FT within the 3 recession years under this scenario to forecast mortgage possession in 2009.

“Actual” means that we use the actual LTV_FTB and Arrear given in this scenario 1 to forecast mortgage possession, whilst “Implied” means that we use the predicted LTV_FTB and Arrear with the macroeconomic variables under this scenario to forecast mortgage possession.

Method (a) refers to the forecasting results estimated by Ordinary Least Square regression with intercept. Method (b) refers to the forecasting results estimated by Ordinary Least Square regression without intercept (**although we do not compute this in these examples from our “plus arrears” model because the estimated intercepts are significantly different from zero**) and Method (c) refers to the forecasting results estimated by Restricted Least Square regression.

When the model was run for the original study (from which the figures here are taken), final 2006 data were not available. However, we considered that it would not be appropriate to forecast future mortgage default based on provisional figures in 2006. Therefore in Version 2 we ignore all the figures in 2006, and forecast mortgage possession in 2006 and 2007 with the actual data in 2005. As in Version 1, we forecast the mortgage possession rate in 2008 under this scenario. All the explanations of terms above also apply to the results in Version 2.

1.4 Results: in Version 1, the actual mortgage default rates in 2005 and 2006 are 9 basis points and 15 basis points respectively. In Method (a), we predict the mortgage possession rates in 2007 and 2008 to be 9 basis points and 19 basis points respectively, conditioning upon the prevailing macroeconomic variables in 2006. In 2009, the predicted mortgage possession under this scenario is around 6 basis points to 10 basis points. In Method (c), using Restricted Least Square regression, we predict the mortgage possession rates in 2007 and 2008 to be 15 basis points and 34 basis points respectively, and we predict mortgage possession rates for 2009 at around 10 basis points to 15 basis points.

In Version 2, actual mortgage default rates in 2004 and 2005 are 5 basis points and 9 basis points respectively. Here, we ignore the available figures in 2006 and forecast mortgage possession rates in 2006 and 2007 based on the actual figures in 2005. We then estimate the mortgage possession rate in 2008. The forecast results in Version 2 are more or less the same as in Version 1, except that all forecasts shift one period backward.

2. UK Recession 1989-1991

2.1 Macroeconomic Environment: this scenario was characterised by moderate to high inflation, a very high interest rate, a slowdown in the rate of house price growth, a moderate to high unemployment rate and very “high” affordability (i.e. a large fraction of disposable income was used for mortgage repayment). LTV was also very high. This period saw the highest historic level of possession at 0.77%.

Macroeconomic Indicators							
	Possession (% of total mortgages outstanding)	Inflation (%)	Growth of House Price (factor)	Unemployment (%) of workforce)	Affordability	First Time Buyers Median LTV (%)	Arrear (6-12 months) (% of total mortgages outstanding)
1989	0.17	7.79	0.20	6.40	1.13	95.00	0.73
1990	0.47	9.44	-0.06	5.80	1.01	95.00	1.31
1991	0.77	5.85	-0.05	7.80	0.73	94.98	1.87

2.2 Forecast Results

Satchell/Chan Forecasting Model - Input						
	Inflation (%)	Growth of House Price (factor)	Unemployment (% of workforce)	Affordability	First Time Buyers Median LTV (%)	Arrear (6-12 months) (% of total mortgages outstanding)
Average Implied	7.69	0.03	6.67	0.96	94.99	1.30
Extreme Implied	5.90	-0.06	7.80	1.13	95.00	1.87
					97.70	1.15

Satchell/Chan Forecasting Model Output								
Version 1 - Based on 2006 figures, forecast 2007, 2008, and scenarios in 2009								
Mortgage Possession (% of Total Mortgages)								
	2005	2006	2007	2008	2009			
					Average		Extreme	
					Actual	Implied	Actual	Implied
(a) Regression with intercept	0.09	0.15	0.09	0.19	0.52	0.36	0.74	0.50
(b) The intercept is significant in this regression*								
(c) Restricted Least Square	0.09	0.15	0.15	0.34	0.64	0.46	0.88	0.63
Version 2 - Based on 2005 figures, forecast 2006, 2007 and scenarios in 2008								
Mortgage Possession (% of Total Mortgages)								
	2004	2005	2006	2007	2008			
					Average		Extreme	
					Actual	Implied	Actual	Implied
(a) Regression with intercept	0.05	0.09	0.10	0.17	0.52	0.36	0.74	0.50
(b) The intercept is significant in this regression*								
(c) Restricted Least Square	0.05	0.09	0.14	0.32	0.64	0.46	0.88	0.63

*see text in bold in 1.3 above

2.3 Explanation: see 1.3 above

2.4 Results: in both Version 1 and Version 2, only the numbers in the columns for the last year differ from those in the first Scenario above, which includes the detail and explanation of the methodology.

In 2009 in Version 1 (or 2008 in version 2), the predicted mortgage possession rate under this scenario ranges from 35 basis points to 75 basis points in most of the cases, except "Extreme – Actual" which predicts nearly 90 basis points.

Under this scenario there is moderate to high inflation but a very high interest rate, a slowdown in the rate of house price growth, a moderate to high unemployment rate, very "high" affordability and a high LTV.

3. Severe Shock

3.1 Macroeconomic Environment: this scenario is characterised by business cycle and exogenous shocks leading to volatile fluctuations in the macroeconomic variables. The unemployment rate is moderate in 2005 but moderate to high in 2008, inflation is low, there is a slowdown and decline in the rate of house price growth and the affordability index is “high” in 2007 and 2008.

3.2 Forecast Results

Satchell and Chan - LTV First Time Buyer - Scenario Forecasting Model								
"Severe"								
	2004	2005	2006	2007	2008	2009	2010	2011
inflation		2.84	3.18	3.00	3.5	4.5		
house price growth		5.16	6.49	0.00	-10.00	-15.00		
unemployment		4.85	5.45	6.50	7.0	6.0		
house price (NW)	£148,658	£156,325	£166,470	£166,470	£149,823	£127,350		
LTV (FTB)		0.89	0.90	0.93	0.95	0.97		
effective mortgage rate	6.21	5.89	6.17	7.00	8.00	7.00		
GDP growth rate		1.80	2.70	0.00	1.00	2.00		
nominal disposable income converted to affordability	£13,364	£13,991	£14,825	£15,270	£15,962	£17,014		
Forecasted LTV First Time Buyers		0.89	0.90	0.93	0.95	0.97	0.95	
Forecasted Arrear			0.48	0.50	0.80	1.30	1.75	
Forecasted Mortgage Possessions	(a)			0.16	0.19	0.33	0.56	0.70
	(b)*	The intercept is significant in this regression						
	(c)			0.18	0.21	0.34	0.55	0.68

* see text in bold in 1.3 above

We use data from 2005 to 2009. LTV_FT B from 2007 to 2011 and Arrears from 2006-2010 are forecast based on the given data. Mortgage possession rates from 2007 to 2011 are forecast based on the forecast LTV_FT B and Arrears from 2006 to 2010.

3.3 Results: methods (a), (b) and (c) – see 1.4 above.

Under both Methods (a) and (c) the forecast mortgage possession rate is around 17 basis points in 2007 and gradually increases to around 63 basis points in 2010 and 2011.

4. “Benign Scenario” and 5. “Average Scenario”

The model input and output are summarised in the tables below.

4.1 Forecast Results

Satchell and Chan - LTV First Time Buyer - Scenario Forecasting Model								
"Long Term Average"								
	2004	2005	2006	2007	2008	2009	2010	2011
inflation		2.84	3.18	3.50	3.5	3.5		
house price growth		5.16	6.49	7.50	7.50	7.50		
unemployment		4.85	5.45	6.00	6.0	6.0		
house price (NW)	£148,658	£156,325	£166,470	£178,955	£192,377	£206,805		
LTV (FTB)		0.89	0.90	0.92	0.92	0.92		
effective mortgage rate	6.21	5.89	6.17	7.00	7.00	7.00		
GDP growth rate		1.80	2.70	2.00	2.00	2.00		
nominal disposable income	£13,364	£13,991	£14,825	£15,651	£16,523	£17,443		
converted to affordability		0.85	0.88	0.98	1.00	1.01		
Forecasted LTV First Time Buyers		0.89	0.93	0.93	0.94	0.94	0.94	
Forecasted Arrear			0.48	0.65	0.67	0.72	0.73	
Forecasted Mortgage Possessions	(a)			0.18	0.24	0.26	0.28	0.28
	(b)*	The intercept is significant in this regression						
	(c)			0.20	0.26	0.27	0.29	0.30

Satchell and Chan - LTV First Time Buyer - Scenario Forecasting Model								
"Current"								
	2004	2005	2006	2007	2008	2009	2010	2011
inflation		2.84	3.18	3.00	3.0	3.0		
house price growth		5.16	6.49	4.00	3.00	3.00		
unemployment		4.85	5.45	4.80	4.8	4.8		
house price (NW)	£148,658	£156,325	£166,470	£173,129	£178,323	£183,672		
LTV (FTB)		0.89	0.90	0.93	0.93	0.93		
effective mortgage rate	6.21	5.89	6.17	6.40	6.40	6.40		
GDP growth rate		1.80	2.70	2.00	2.00	2.00		
nominal disposable income	£13,364	£13,991	£14,825	£15,575	£16,363	£17,191		
converted to affordability		0.85	0.88	0.92	0.90	0.88		
Forecasted LTV First Time Buyers		0.89	0.90	0.93	0.93	0.93	0.93	
Forecasted Arrear			0.48	0.50	0.73	0.74	0.75	
Forecasted Mortgage Possessions	(a)			0.16	0.19	0.27	0.27	0.28
	(b)*	The intercept is significant in this regression						
	(c)			0.18	0.21	0.29	0.29	0.29

*see text in bold in 1.3 above