

# Stochastic GBM Methods for Modeling Market Prices

## Appendix A

### ESG Prototype: Model Parameters

US Economy : Sample Parameters

**Valuation Date** 2010.12

Projection Period	50	time steps
Time Step	1.000	in years
Real Estate Time Step	1.000	in years

**Observed Term Structure (linearly interpolated between key rates)**

	1-yr	2-yr	3-yr	4-yr	5-yr	6-yr	7-yr	8-yr	9-yr	10-yr
	0.29	0.62	1.06	1.49	1.93	2.20	2.47	2.75	3.02	3.29
	11-yr	12-yr	13-yr	14-yr	15-yr	16-yr	17-yr	18-yr	19-yr	20-yr
	3.35	3.40	3.46	3.52	3.57	3.63	3.69	3.74	3.80	3.86
	21-yr	22-yr	23-yr	24-yr	25-yr	26-yr	27-yr	28-yr	29-yr	30-yr
	3.91	3.97	4.02	4.08	4.14	4.19	4.25	4.31	4.36	4.42
	31-yr	32-yr	33-yr	34-yr	35-yr	36-yr	37-yr	38-yr	39-yr	40-yr
	4.43	4.44	4.45	4.46	4.47	4.47	4.48	4.49	4.50	4.51
	41-yr	42-yr	43-yr	44-yr	45-yr	46-yr	47-yr	48-yr	49-yr	50-yr
	4.52	4.53	4.54	4.55	4.56	4.56	4.57	4.58	4.59	4.60

**Current Risk Free Term Structure**

Current 3-mo rate	0.14%	per year
Current 1-yr rate	0.29%	
Current 2-yr rate	0.62%	
Current 5-yr rate	1.93%	
Current 10-yr rate	3.29%	
Current 30-yr rate	4.42%	
50-yr Selection	4.60%	

**Real Rate Parameters**

Long INT Reversion Mean	0.0432
Long INT Reversion Speed	0.3516
Short INT Reversion Speed	0.1382

Long INT Volatility	2.33%
Short INT Volatility	2.18%

**Inflation Parameters**

Initial Inflation	0.0148
INF Mean	0.0259
INF Reversion Speed	0.3852

INF Volatility 0.0215

**Large and Small Stock Parameters**

**Medical Inflation Parameters**

Initial MED INF	0.0324
MED INF Mean	0.0271
MED INF Volatility	0.0088
MED INF Reversion Speed	0.0709

		Prob			
Stage0 Mean LS Return	9.00%	Stage0 LS Volatility	10.12%	stage: 1	0.9760
Stage1 Mean LS Return	-26.16%	Stage1 LS Volatility	27.12%	stage: 2	0.8507
Stage0 Mean SS Return	8.16%	Stage0 SS Volatility	13.86%	stage: 1	0.9760
Stage1 Mean SS Return	3.60%	Stage1 SS Volatility	57.50%	stage: 2	0.9000

**Dividend Parameters**

DIV Reversion Mean	4.17%
DIV Reversion	0.13
Initial DIV	1.83%

DIV Volatility 0.85%

**Correlation Parameters**

Correl LS, SS Regime Switch	90%
Correl LS, SS Return	90%
Correl DIV, LS	-25%

Dependence method to use?

Rank Dependence

**Real Estate Parameters**

RE Reversion Mean	2.22%
RE Reversion Speed	0.87
Initial RE	4.62%

RE Volatility 2.82%

Correl INF, DIV -50%

Correl Short, Long INT 68%  
Correl INF, Short Real INT 2%

Correl INF, MED INF 72%