

- Absolute prepayment speed (ABS), 45
- Action buttons, 6
- Actual/actual day-count system, 11–12
- Actual/360 day-count system, 11–12, 14, 17
- Actual/365 day-count system, 11, 14, 17
- Advanced liability structures
 - reserve accounts, 117–122
 - swaps, 113–117
 - triggers, 107–113
- Advance rate, 147, 150
- Agency bonds, 11
- Amort Factor, 53
- Amortization
 - asset cash flow, 23–27
 - asset principal check, 129
 - cash flow, 90
 - cash flow waterfall and, 90, 102–103, 105
 - dates and timing, 6, 14
 - fixed rate inputs, 28
 - floating rate, 28–29
 - interest rate swaps, 115
 - level payment, 89
 - loss curves, 74–82, 147
 - monthly yields, 131
 - prepayment rates, 151
 - principal allocation and, 150
 - principal return and, 108
 - projected prepayments in, 53–55
 - significance of, 6–7, 14
 - timing, 136
 - trigger analysis, 110–111
- Analytics, *see* Performance analytics
- Analytic sheet, looping to, 164
- AND function, 110, 123
- Annual interest rate, 97
- Array formulas, 142–143
- Asset(s)
 - assumptions, generally, 2
 - cash flow generation, *see* Asset cash flow generation
 - classes, 1–2, 44
 - inputs, 4
 - interactions, 104–105
 - interest rate curve selection, 54
 - pool, 54
 - principal check test, 129
- Asset Based Fee, calculation of, 93
- Asset cash flow generation
 - cash flow sheet, 33
 - defined, 23
 - input sheets, 27–33
 - loan level *vs.* representative line amortization, 23–27
 - notional asset amortization on cash flow sheet, 33–39
- Asset-specific data, 6
- Auctions, recovery process, 84
- Auditor, functions of, 2–3
- Automation, using VBA, *see* Visual Basic Applications (VBA)
- Automobile Lease Guide* (ALG), 88
- Automobile loans/leases, 1, 84
- Back-loaded loss curves, 69, 152
- Balance calculations, loss curves and, 74
- Balances at maturity tests, 128–129
- Balance sheet type model, 14
- Bank fees, 91
- Bank funding, interest rates, 94–95
- Base assumptions, determination of, 6
- Beginning of period (BOP), 33
- Bond-equivalent yield (BEY), 133
- Bond market, 95
- Boolean variables, 111, 158
- Buy and hold transactions, 24
- Caps, 36–37, 95
- Carry cost, 84
- Cash flow analysis, 2
- Cash flow
 - analysis, 2
 - delinquency and, 61
 - generation of, *see* Asset cash flow generation; Cash flow generation
 - model, *see* Cash flow model
 - projected recoveries, 86–88
 - structure, 3–5
 - waterfall, *see* Cash flow waterfall
- Cash flow generation
 - influential factors, 4
 - loss projections and, 73–74
- Cash flow model
 - advanced, 6
 - assumptions, validation of, 6
 - basic elements of, 3–5
 - building process, 5–7
 - overview of, 1–2
 - test model, 7

- Cash Flow sheet
 cash flow waterfall, 90, 94, 96–99
 characteristics of, 6
 dates and timing, 14–18
 interest rate swap, 115–117
 internal tests, 126, 128
 loss curves, 148–149
 notional asset amortization on, 33–39
 prepayments, 54–55
 projected recoveries, 87–88
 trigger analysis, 110–111
- Cash flow waterfall
 asset structure, 105–106
 checking calculations, 122–123
 color system, 123
 conceptual construction method, 99
 fee calculation, 91–95
 interest calculation, 95–100
 liabilities, 91, 145
 liability structure, 105–106
 output reports, 138
 payment priority, 89–91
 performance analytics, 130–133
 period progression, 90
 principal calculation, 100–105
 reserve accounts and, 118, 121–123
 trigger analysis, 109–110, 112
- Cash Flow snapshot, in output report, 135, 138, 140
- Cash generation, sources of, 2.
See also Asset cash flow generation; Cash flow
- Cash in *vs.* cash out test, 126–128
- CBO/CLO/CDO, 1
- CD-ROM guidelines
 asset cash flow generation, 26
 cash flow waterfall, 94, 99, 105
 dates and timing, 12
- historical delinquency curves, 62
- interest rate swaps, 115
- losses, 147
- output report creation, 136–137
- prepayments, 54
- recovery process, 84
- Cells, naming, 12–13, 18
- Charts, in output report, 135, 140
- Closing date
 dates and timing, 14–15, 19
 defined, 10
- Commercial mortgages, 1
- Comparables studies, 73
- Complete prepayment, 43
- Conditional formatting, 127–129, 140–141
- Conditional prepayment rate (CPR), 44, 52
- Core determinant, 82
- Corporate bonds, 11
- COUNT formula, 50
- Credit
 collections, 82
 enhancement, 95, 103, 106, 136, 148
 memos, 6
 rating, significance of, 151
 rating agencies, 2
 -related events, 43
 score, 61
 trends, 60–61
- Credit card receivables, 1
- Cumulative default rate, 108
- Cumulative loss curves, 66–69
- Cumulative loss percentage, 136
- Cumulative Prepayment Rate (CDR), 44
- Curves, *see* Prepayment curves
- Data
 accuracy, 6
 aggregation, recovery process, 85–86
 manipulation, 1, 86
 validation, 19–21, 81, 109
- Databases, as information resource, 6
- Dates and timing
 on cash flow sheet, 14–18
 day-count systems, 11–12
 EDATE, 14, 16, 21
 importance of, 6, 9
 inputs sheet, 10, 12–14
 time progression, 9–10
- Dates method, historical loss curves, 67
- Day count systems, 11–12, 115
- DAYS360 function, 11
- Deal structure, 6
- Debt rate, 95. *See also specific types of debt*
- Debt tranches, monthly yield calculation, 133
- Default
 cash flow waterfall and, 105
 classification of, 83–84
 defined, 60
 influential factors, 6–7, 100
 mortgage, 23–24, 26
 new, 102
 prepayments, 55
 rate, loss curves, 80
 timing, loss curves, 75–76
 trigger analysis, 110, 150
- Definitive pools, 23–24
- Delinquency
 analysis, importance of, 60–61
vs. defaults *vs.* loss, 59–60
 defined, 59
 historical curves, 61–64
 severity of, 61
 trigger analysis, 108, 110
- Design phase, *see* Planning and design phase
- Divide-and-conquer algorithm, 132
- #DIV/0 errors, 49, 55, 62
- Documentation, 6
- Duration, modified, 133–134
- Dynamic portfolios, 65–66

- EDATE, 14, 16, 21
- Eligibility criteria, 26–27
- Emerging market remittances, 1
- Ending balance, loss curves, 82
- Ending date, 11
- End of period (EOP), 33
- Equipment leases, 1
- Equity payments, 4, 95
- Errors
- array formulas, 143
 - #DIV/0, 49, 55, 62
 - internal tests, 127, 129
 - output reports, 135, 143
 - recoveries, 152
- European day-count system, 11
- European systems, 11
- Excess spread
- cash flow waterfall, 102–103, 106
 - loss analysis, 61, 69
 - negative, 108
 - prepayments and, 48
 - significance of, 146
 - trigger analysis, 109
- Expected loss, 72–73
- Fabozzi, Frank J., 60
- FALSE statement, 110, 138
- Fees
- as liabilities, 89, 91
 - loss curves and, 148
 - reserve accounts, 118
 - types of, 4
- Financial guaranties, 146–147, 149
- First payment date
- dates and timing, 16
 - defined, 10
- Fitch, as information resource, 2
- Fixed-for-floating interest rate swap, 114
- Fixed interest rate, 95–96
- Fixed rate mortgage, 47
- Floating rate
- assets, 27–28
 - functions, 36
 - liabilities and, 113–114
 - mortgage, 47
 - system, 39, 95, 153
- Foreclosure, 43, 60
- Formatting, conditional, *see* Conditional formatting
- Front-loaded loss, 69, 76, 152
- Future cash flow, projection of, 23
- Global inputs, 4
- Global trigger, 112
- Goal Seek tool, 132–133, 141–142, 149–150, 158, 161–164
- Gregorian calendar, 11
- Gross cumulation defaults, 108, 110
- Gross cumulative loss, 136
- Gross loss, 64, 83–84
- Growth adjustment, 66
- Guaranteed investment contracts (GICs), 149
- Guaranties, *see* Financial guaranties
- Hedging instruments, 95
- Hidden Sheet
- cash flow sheet, dates and timing, 16
 - input sheets, *see* Input sheets
 - trigger analysis, 109
- High-growth portfolio, 66
- Historical data, 6, 44, 46, 64
- Historical default rate, 108
- Historical delinquency curves, 62–64
- Historical loss curves
- analysis, 59, 69–70, 74
 - comparison of origination pools, 64–65
 - derivation of, 64–67
 - Model Builder, 67–73
 - severity of loss, 69, 72, 74, 77–78
 - static analysis, 64, 73
 - time progression, 67
 - vintage, 69–73
- Historical recovery analysis, 85–86
- Horizontal progression of time, 9, 14
- IF-AND combination, cash flow waterfall, 104
- IF statement
- array formulas, 142
 - asset cash flow generation, 39
 - cash flow waterfall, 102, 104–105
 - dates and timing, 16–17
 - loss curves, 72–73, 81
 - prepayments, 49, 55
 - trigger analysis, 112
- Indentures, 6
- Inflow of cash, 23
- Information gathering, cash flow model construction, 6
- Infrastructure, 2
- Input Sheets
- asset assumptions, 31
 - cash flow model, 3–4
 - cash flow waterfall, 91–92, 96–97, 101
 - dates and timing, 10, 12–14
 - internal tests, 129–130
 - prepayments, 54
- Inputs
- determination of, 6
 - trigger analysis, 109–111
 - significance of, 7
- Institutional investors, 48
- Interest, *see* Interest rate
- calculation, 23
 - cost, 84
 - as liability, 89
 - monthly yields and, 131
- Interest rate
- asset cash flow generation, 38–39
 - cash flow waterfall, 94–100
 - delinquency and, 61
 - floating, 34
 - influential factors, 151
 - reserve accounts and, 122
 - swap, *see* Interest rate swap
 - vectors, 4, 29

- Interest rate swap
 - characteristics of, 113–114, 153
 - incorporating, 114–117
- Internal testing
 - asset principal tests, 129
 - balances at maturity tests, 128–129
 - cash in *vs.* cash out test, 126–128
 - importance of, 140, 153
- Investment banks, 95, 175
- Investment decision, influential factors, 135

- Legal proceedings, types of, 83
- Legal structure, 3
- Liabilities
 - amortization, 7
 - assumptions, 2
 - cost, 48
 - individual, 90–91
 - inputs, 4
 - interactions, 104–105
 - payment priority, 89–91, 107
 - principal and interest, 6
 - rates, 149
 - recovery process, 87
 - structures, 4. *See also*
 - Advanced liability structures
 - types of, 89, 91, 145
- LIBOR (London Interbank Offered Rate), 29, 31, 34, 36, 94–95, 114–115
- Lifetime cap/floor, 28, 32
- Liquidation
 - historical loss curves, 65–66
 - recovery process, 84, 86
- Liquidity
 - delinquency and, 60, 63–64
 - level asset generation, 24, 26
- Loss
 - defined, 60
 - historical, 6
 - influential factors, 146
 - severity, 71–72, 83
 - timing, 136
- Loss % Taken, 72
- Loss curves, *see* Historical loss curves
 - characteristics of, 4
 - historical, 64–68
 - integrated historical and projected, 73–82
 - prepayment rates, 151
 - projecting, 67–68, 70–71
 - timing, 69–70
 - timing sheet, loss curves, 76–82
- Loss to be Dist., 72

- Margin, 94, 97, 148
- Market value decline (MVD), 88
- MATCH function, 35, 38, 40–41
- Maturity
 - final, 9
 - historical loss curves, 70–71
 - internal tests, 128–129
 - liability interactions and, 106
 - loss curves, 75–76
- MAX formula
 - asset cash flow generation, 37
 - prepayments, 55
 - reserve accounts, 121
- Methodology, accuracy of, 6
- Microsoft Excel
 - functions, *see specific functions*
 - macros, 173
 - row constraints, 5, 9–10
- MIN formula
 - asset cash flow generation, 37
 - cash flow waterfall, 93, 103
 - interest rate swap, 116
 - loss curves, 81
 - output reports, 136
 - prepayments, 55
 - trigger analysis, 112–113
- Minimum reserve, 118, 121
- Model Builders. *See also* CD-ROM guidelines
 - asset cash flow generation, 27, 29–39
 - automating Goal Seek, 161–167
 - cash flow waterfall, 91–105
 - dates and timing, 12–18
 - delinquency analysis, 61–64
 - historical loss curves, 67–68
 - internal tests, 126–130
 - output report, 136–140
 - performance analytics, 134
 - prepayment, R8-T6, 151
 - print procedures, 158–161
 - projected prepayment,
 - integration into asset amortization, 53–55
 - transaction scenario generator
 - creation, 167–173
 - trigger incorporation, 108–113
- MOD function, 41
 - asset cash flow generation, 37, 41
 - OFFSET function, 10, 35–36, 39–40
 - PMT function, 41
- Monte Carlo simulation, 2
- Monthly default rate (MDR), 74
- Monthly yield, 130–133
- Moody's, as information resource, 2
- Mortgage loans
 - defaults, 23–24, 26
 - default timeline, 60–61
 - interest rates and, 47
 - obligor, responsibilities of, 43
 - payoff, 24, 26
 - types of, 1
- Mortgage-backed securities, 4–5, 11
- Moving cash, 4
- Municipal bonds, 11

- National Association of Securities Dealers (NASD), 11
- Natural resources, 2
- Net loss, 83

- New loans, loss curves and, 75–76
- 90-day delinquency, 60
- Nonperforming loan (NPL) groups, 88
- Notional amortization, 39, 82
- OFFSET function
 - asset cash flow generation, 35, 39–40
 - dates and timing, 10
 - historical delinquency curves, 62–63
 - historical loss curves, 71–72
 - output reports, 140
 - prepayments, 50–51, 57
 - projected recoveries, 87
- OFFSET-MATCH combination
 - asset cash flow generation, 38
 - cash flow waterfall, 97
 - loss curves, 78–79
 - prepayments, 54–55
- OR function, 111–112, 123
- Origination
 - “base,” 71
 - date, significance of, 67–68
 - period, 59, 64, 67
- Output reporting
 - components of, 135
 - creation of, 136–140
- Outputs, cash flow model, 3, 5
- Overcollateralization, 146–147, 149
- Parsing risk, 95, 100
- Partial prepayment, 43
- Payment(s)
 - frequency (PMTFreq), 10–11, 13–14, 16
 - prepayment, *see* Prepayments
 - priority, 107–108
- Performance analytics
 - bond-equivalent yield (BEY), 133
 - duration, 133–134
 - monthly yield, 130–133
- Period, defined, 14
- Periodic rate cap/floor, 28
- Periods-out method, 67
- Planning and design phase, cash flow model construction, 5
- PMT function, 38–39, 41
- Prepay Analysis sheet, 52
- Prepayment curves
 - building, 46–52
 - in project model builder, 47–48
- Prepayments
 - absolute speed (ABS), 45
 - analysis, 4, 6, 49
 - assumptions, 23
 - calculation of, 44
 - cash flow waterfall and, 105
 - CPR (conditional prepayment rate), 44
 - curves, *see* Prepayment curves
 - historical, data formats, 46
 - projected, integration in asset amortization, 53–55
 - PSA (Public Securities Association), 44–45
 - rates, 151
 - single monthly mortality (SMM), 44–46
 - structured transactions, effect on, 48–49
 - tracking process, 43–45
 - voluntary, 102, 131
- Preplanned events, 9
- Present value (PV), monthly yield calculation, 131, 133
- Prime rate, 94
- Principal
 - allocation methods, 150–151
 - cash flow waterfall, 100–105
 - and interest, 23
 - as liability, 89
 - return, timing of, 107–108
- Principal Due calculation, reserve accounts, 122
- PRINT, VBA, 158–161
- Pro rata principal payment, 100–103, 150
- Project Explorer, VBA, 157
- Project Model Builder
 - asset cash flow generation, 27
 - cash flow waterfall, 92, 96, 98
 - dates and timing, 12
 - default, 61
 - interest rate swap, 114
 - internal tests, 128
 - loss curves, 76, 147–148, 152
 - prepayments, 46–48, 52, 151
 - recoveries, 87–88
 - reserve accounts, 118–122
 - senior subordinated debt, 100
 - swaps, 153
 - testing, 153
 - trigger analysis, 111–112
- Projected loss curves, 67–68, 70–73
- Properties Window, VBA, 157
- Prospectus, 2
- Proxy information, 6
- Public Securities Association (PSA)
 - loss curves, 71, 79
 - prepayments, 44–45, 54
- Qualitative triggers, 108
- Quantity of data, significance of, 73
- Ranges, naming, 13, 19, 21, 31
- Rate, *see* Interest rate
 - recovery, 6, 83, 86–87, 152–153
 - reset frequency, 28
 - step-ups, 9
- Rating agencies
 - fees, 89, 91
 - functions of, 52, 59, 95
- Receivables, 65–66
- Recoveries
 - assumptions, 84
 - cash flow waterfall and, 105
 - characteristics of, 23, 83–85, 89
 - monthly yields and, 131
 - projection, in cash flow model, 86
 - timeline of, 83–84
- Recovery lag, 83, 85–86, 152

- Recovery rate, 6, 83, 86–87, 152–153
- Refinancing, 24, 26, 43
- Reimbursement, reserve accounts, 4, 118, 120–121
- Reporting results
array formulas, 142–143
conditional formatting, 127–129, 140–141
internal testing, 125–129
output reporting, 135–140
performance analytics, 130–133
- Repossession, 83–84
- Representative line analysis, 24
- Reserve accounts, 6, 69, 117–122, 146
- Residential mortgages, 1
- Residual value, 88
- Risk management, 95
- Risk mitigation, 95, 100
- Rolling average triggers, 108
- ROUND function, internal tests, 129
- Scenario Assumption, in output report, 135
- Seasoned assets, prepayments, 55
- Seasoning
asset cash flow generation, 31
output reports, 136
loss curves, 75–76
- Senior debt, 91–93, 96, 98–102, 109, 112, 121, 128, 147, 149–150
- Senior interest and principal, 4
- Senior investors, advanced liability structures, 107
- Senior principal, cash flow waterfall, 104
- Senior subordinated structure, 92
- Senior tranches, 104, 136
- Sequential principal payment, 100–101, 104–105, 150
- Serial numbers, 11
- Servicer fees, 89, 91, 148
- Severity, loss curves, 64, 69, 72, 74, 76
- Simulations, 6
- Single monthly mortality (SMM), prepayments, 44–46, 49, 51–52, 54–55, 151
- Slope analysis, 73
- Small business loans, 1
- Standard & Poor's
as information resource, 2
on static loss data, 65–66
- Standard default assumption (SDA)
loss curves, 74, 76, 79–81
trigger analysis, 110
- Start date, 11
- Static loss
analysis, 64, 67, 71, 73
report, 59
- Static pool data, 65–66
- Stressor, for prepayments, 54
- Stress scenarios, 106, 151
- Structured finance model
financial guarantors
perspective, 177
investment bank perspective, 175
investor perspective, 176
issuer perspective, 176
loss, effects of, 146–150
loss timing, 152
overview of, 145–147, 177
principal allocation
methodologies and, 150–151
recoveries, 152
swaps, 153
testing, 153
top-down approach, 145
transaction cash, 145–146
- Subordinate debt, 95, 100, 104–105, 128, 147, 150
- Subordinated interest and principal, 4, 104
- Subordinated tranche, trigger analysis, 111
- SUM function
historical loss curves, 71
prepayments, 50, 56–57
recovery process, 85
- SUMIF function, recovery process, 85
- Summary sheet, 51–52
- SUMPRODUCT function
historical loss curves, 73
prepayments, 51, 56–57
- SUMPRODUCT-SUM function
historical delinquency curves, 62
output reports, 138
prepayments, 49–50, 56–57
- Surety, 2
- Swaps, *see* Interest rate swaps
characteristics of, 95, 113–117, 153
expenses, 117
rate, 94
- “Take the lesser of what is available and what is needed” rule, 98
- Taxation, 4
- Templates, 6
- Term sheets, 6, 89
- Testing
cash flow model, 7
importance of, 6
internal, *see* Internal tests
- 30/360-day-count system, 11, 17
- Timeshares, 1
- Timing, *see* Dates and timing
Curve, 152
historical loss curves, 69–70
loss curves, 76–82
scenarios, 152
significance of, 6
time progression, 9–10
- Toolbox
dates and timing, 18–21
MATCH function, 40–41
MOD function, 41
OFFSET function, 39–40
PMT function, 41

- weighted average using
 SUMPRODUCT and
 SUM, 5–57
- Total returns, 48
- Tranches, 89, 100. *See also*
 specific types of tranches
- Transaction fees, 4, 6
- Trending, historical loss curves,
 70–71
- Trigger(s)
 - defined, 4
 - breach of, 108, 110, 150
 - historical loss curves, 69
 - liability structures, 107–113
 - tracking, output reports, 138
 - types of, 6, 150–151
- TRUE value, 110, 138
- Trust(s)
 - documents, 6
 - fees, 89, 91
- Underwriting, 65
- U.S. Treasury bills, 11
- Unpaid interest, 99
- User-generated curve, loss
 curves, 81
- Vectors sheet
 - asset cash flow generation,
 29–34, 37
- cash flow waterfall, 96–97
- interest rate swap, 115–116
- loss curves, 78–79
- prepayments, 54
- Vertical progression of time, 9,
 14
- Vintage analysis, 46, 49
- Vintage loss curves, 69–73
- Visual Basic Applications (VBA)
 - characteristics of, generally,
 27, 133
 - Code, 155, 157–158
 - Editor (VBE), 156–157
 - Goal Seek tool, 158, 161–164
 - looping to Analytic sheet, 164
 - print, 158–161
 - scenario generation, 167
 - transaction analytics,
 164–167
 - transaction scenario
 generation, 167–173
- Visual Basic Editor (VBE),
 156–157
- VLOOKUP, 35
- Volatility, impact of, 73,
 117
- WA SMM curve, 50–52
- Waterfall, defined, 89. *See also*
 Cash flow waterfall
- Weighted average
 - coupon deterioration (WAC
 deterioration), 151
 - curve, *see* Weighted average
 curve
 - fixed rate, 113
 - formula, historical
 - delinquency curves,
 62–63
 - life (WAL), 107, 137–138,
 152
 - rate, 24
 - terms, 24
- Weighted average curve
 - historical loss curves,
 69–73
 - prepayments, 46–47,
 50–51
- “What You Have and What
 You Need,” 90–91,
 93–94, 103, 119, 121
- Withdrawals, reserve accounts,
 119–120
- Worst-case scenarios,
 109
- YEAR function, recovery
 process, 85
- Zero-balance periods, 62