

Source | Option Family

pad

1 Description

Premia 14

This family is split in the LookBack family and the Asian family.

1.1 LookBack Options

The payoff is given by:

$\varphi(S_T, M_{T_0, T_1})$, or $\varphi(S_T, m_{T_0, T_1})$ which is paid at the maturity T where M is the maximum and m the minimum of the underlying over the period $[T_0, T_1]$. Two varieties exist:

- Total LookBack
Then M or m are computed over the whole life of the option, ie T_0 and T_1 are irrelevant.
- Partial LookBack
 M or m are computed between the starting date T_0 and the final date T_1 with $T_1 \leq T$. Note that T_0 may be less than the pricing date or greater than the pricing date (forward-starting case). A partial LookBack may be Continuous or Discrete, in which case the maximum M or the minimum m is taken from a regular sampling of the underlying between T_0 and T_1 , which is specified by the number SamplingDates.

1.2 Asian Options

The payoff is given by: $\varphi(S_T, A_{T_0, T_1})$, which is paid at the maturity T where A is the average of the underlying over the period $[T_0, T_1]$. Two varieties exist:

- Forward-Starting Asian
 T_0 is greater or equal to the pricing date.
- Backward-Starting Asian
 T_0 is less than or equal to the pricing date.

An asian option may be Continuous or Discrete, in which case the average A is taken from a regular sampling of the underlying between T_0 and T_1 , which is specified by the number SamplingDates.

2 Code Implementation

```

#ifndef _PAD_H
#define _PAD_H

#include "optype.h"
#include "var.h"

#include "chk.h"
#include "numfunc.h"

#define TYPEOPT PAD

/*PathDep Option*/
typedef struct TYPEOPT{
    VAR                                     Maturity;
    VAR      PayOff; /* The Payoff is phi(stock,path_dep) */
    VAR  PathDep; /* The PathDep functional definition:

new_path-dep=psi(PathDep->Par,stock,time)

where:

starting_date is in PathDep->Par[0],
final_date is in PathDep->Par[1],
frequency is in PathDep->Par[2],
initial_path_dep is in PathDep->Par[3],
current_path_dep is in PathDep->Par[4]

!!!!!!WARNING!!!!!!
Wether the pathdep is backard/forward

```

```
should be tested in ChkOpt
*/
```

```
VAR    MinOrElse; /* cf supra*/
VAR    EuOrAm;
VAR    PartOrTot; /* Partial or total pathdep:
```

```
a partial pathdep is specified
by starting_date, final_date*/
```

```
VAR    ContOrDisc; /*Continuous or Discrete:
a discrete pathdep is specified
by frequency (regular sampling) */

/* /\*Cliquet options*\//
* VAR Fg;
* VAR Cg;
* VAR Fl;
* VAR Cl; */
```

```
} TYPEOPT;
```

```
/*MinOrElse*/
#define MINIMUM 0
#define MAXIMUM 1
#define AVERAGE 2
```

```
int OPT(Get)(int user,Planning *pt_plan,Option *opt, Model *mod);
int OPT(FGet)(char **InputFile,int user,Planning *pt_plan,Option *opt, Model *mo
int OPT(Show)(int user,Planning *pt_plan,Option *opt, Model *mod);
int OPT(Check)(int user,Planning *pt_plan,Option *opt);
```

```
#endif
```