

mer1d

1 Description

The underlying asset price evolves according to the Merton model, that is:

$$\begin{cases} S_{T-t} = s \\ \frac{dS_u}{S_u} = (r - \lambda \mathbb{E}U_1 - d)du + \sigma dB_u + d(\sum_{j=1}^{N_u} U_j), \end{cases} \quad (1)$$

where $(B_u)_{t \geq 0}$ is a Brownian motion, $(N_u)_{u \geq 0}$ is a Poisson process with deterministic jump intensity λ , $(U_u)_{j \geq 1}$ is a sequence of positive, independent stochastic variables and σ is a constant

2 Code Implementation

```
#ifndef _MER1D_H
#define _MER1D_H

#include "optype.h"
#include "var.h"
#include "error_msg.h"
#include "enums.h"

#define TYPEMOD MER1D

/*1D Merton World*/
typedef struct TYPEMOD
{
    VAR T;
    VAR S0;
    VAR Mu;
```

```
VAR Sigma;  
VAR Divid;  
VAR R;  
VAR Lambda;  
VAR Mean;  
VAR Variance;  
} TYPEMOD;
```

```
#endif
```