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# bsdisdiv1d

## 1 Description

We consider a market model in which the risky asset pays a dividend at some given dates. Let  $0 < t_1 < \dots, t_n \leq T$  be the dividend payment dates. We assume that only fixed dividends are payed (there is no proportional payment). Let  $S$  denote the underlying asset, then for all  $1 \leq i \leq n$

$$S_{t_i} = S_{t_i^-} - D_i$$

Between two payment dates,  $S$  is governed by the Black-Scholes model

$$dS_t = S_t(rdt + \sigma dB_t), \quad S_0 = s_0, \quad (1)$$

where  $(B_t)_{0 \leq t \leq T}$  is a standard Brownian motion, under the risk neutral measure. The non negative constant  $r$  is the instantaneous interest rate and  $\sigma$  is the volatility of the risky asset.

## 2 Code Implementation

```
#ifndef _BSDISDIV1D_H
#define _BSDISDIV1D_H
#include "optype.h"
#include "var.h"

#define TYPEMOD BSDISDIV1D

/*1D BlackScholes World with Discrete Dividends*/
typedef struct TYPEMOD
{
    VAR Size;
```

```
VAR T;  
VAR S0;  
VAR R;  
VAR Mu;  
VAR Sigma;  
VAR Amounts;  
VAR Dates;  
} TYPEMOD;
```

```
#endif
```