Template | fairmat

IRS Variabile Protetto Differenziale

IRS Variabile Protetto Differenziale exchanges periodically two floating interest payments indexed to the *6-Months Euribor*. In addition *Party A* rate is determined through another differential function which value depends on the long-term and mid-term swap rates (*30-Years CMS* rate and *2-Years CMS* rate).

IRS Variabile Protetto Differenziale Schedule				
Up-front	–			
Principal (Party A)	1,000,000 *bullet*			
Principal (Party B)	1,000,000 *bullet*			
Trade Date	09/02/2005			
Effective Date	11/02/2005			
Termination Date	11/02/2013			
Payment Frequency (Party A)	$Semi - Annual$			
Payment Frequency (Party B)	$Semi - Annual$			
Exchange	**Party A**			**Party B**
First year	If *EUR Euribor 6M* $< 2.7\%$		*EUR Euribor 6M*	*EUR Euribor 6M*
	otherwise		2.7%	
From the Second to the Third year	If *EUR Euribor 6M* $< 4\%$	If $D < 1.3\%$	max(*EUR Euribor 6M*+2.45%;0)	*EUR Euribor 6M*
		If $1.3\% \leq D < 2.00\%$	max(*EUR Euribor 6M*+0.55%;0)	
		If $D \geq 2.00\%$	max(*EUR Euribor 6M*-0.45%;0)	
	otherwise	If $D < 1.3\%$	6.450%	*EUR Euribor 6M*
		If $1.3\% \leq D < 2.00\%$	4.550%	
		If $D \geq 2.00\%$	3.550%	
From the Fourth to the Eight year	If *EUR Euribor 6M* $< 4.75\%$	If $D < 1.15\%$	max(*EUR Euribor 6M*+2.65%;0)	*EUR Euribor 6M*
		If $1.15\% \leq D < 1.80\%$	max(*EUR Euribor 6M*+0.75%;0)	
		If $D \geq 1.80\%$	max(*EUR Euribor 6M*-0.25%;0)	
	otherwise	If $D < 1.15\%$	7.40%	*EUR Euribor 6M*
		If $1.15\% \leq D < 1.80\%$	5.50%	
		If $D \geq 1.80\%$	4.50%	
	$D =$ *30-Year CMS* $-$ *2-Year CMS*			
Convention	**Party A**			**Party B**
Reset Dates	*Arrears*, 2 days before			*Advance*, 2 days before
Day Count Fraction	*Act/360 (Unadjusted)*			*30/360 (Unadjusted)*

Table 1: *Example of IRS Variabile Protetto Differenziale template.*

IRS Variabile Protetto Differenziale Schedule		**on *Fairmat***		
Up-front	–			
Principal (Party A)	**Na**			
Principal (Party B)	**Nb**			
Trade Date	Trading date (simulation start date)			
Effective Date	Contract initial date			
Termination Date	**PdA**[end] or **PdB**[end]			
Payment Frequency (Party A)	**matEur**-Year (exchange per year)			
Payment Frequency (Party B)	**matEur**-Year (exchange per year)			
Exchange	**Party A**			**Party B**
from 1 to **timeF1**	If **matEur**-Year Euribor < **threshEur**		**matEur**-Year Euribor	**matEur**-Year Euribor
	otherwise		**threshEur**	
from (**timeF1**+1) to **TD**	If **matEur**-Year Euribor < **threshEur**	If **D** < **Low**	max(**matEur**-Year Euribor+**Sprlow**;0)	**matEur**-Year Euribor
		If **Low** ≤ **D** < **High**	max(**matEur**-Year Euribor+**Sprmed**;0)	
		If **D** ≥ **High**	max(**matEur**-Year Euribor+**Sprhigh**;0)	
	otherwise	If **D** < **Low**	**threshEur** + **Sprlow**	**matEur**-Year Euribor
		If **Low** ≤ **D** < **High**	**threshEur** + **Sprmid**	
		If **D** ≥ **High**	**threshEur** + **Sprhigh**	
	D = **matCMS1**-Year CMS - **matCMS2**-Year CMS			
Convention	**Party A**			**Party B**
Reset Dates	**Arrears**, **RdayA** days before			**Advance**, **RdayB** days before
Day Count Fraction	**DurA**			**DurB**

Table 2: *Example of IRS Variabile Protetto Differenziale template described through Fairmat objects.*

Na	Nb	pduA	pduB	threshEur	Low	High	Sprlow	Sprmed	Sprhigh
1000000	1000000	11/08/2005	11/08/2005	2.70%	0.00%	0.00%	0.00%	0.00%	0.00%
1000000	1000000	11/02/2006	11/02/2006	2.70%	0.00%	0.00%	0.00%	0.00%	0.00%
1000000	1000000	11/08/2006	11/08/2006	4.00%	1.30%	2.00%	2.45%	0.55%	−0.45%
1000000	1000000	11/02/2007	11/02/2007	4.00%	1.30%	2.00%	2.45%	0.55%	−0.45%
1000000	1000000	11/08/2007	11/08/2007	4.00%	1.30%	2.00%	2.45%	0.55%	−0.45%
1000000	1000000	11/02/2008	11/02/2008	4.00%	1.30%	2.00%	2.45%	0.55%	−0.45%
1000000	1000000	11/08/2008	11/08/2008	4.75%	1.15%	1.80%	2.65%	0.75%	−0.25%
1000000	1000000	11/02/2009	11/02/2009	4.75%	1.15%	1.80%	2.65%	0.75%	−0.25%
1000000	1000000	11/08/2009	11/08/2009	4.75%	1.15%	1.80%	2.65%	0.75%	−0.25%
1000000	1000000	11/02/2010	11/02/2010	4.75%	1.15%	1.80%	2.65%	0.75%	−0.25%
1000000	1000000	11/08/2010	11/08/2010	4.75%	1.15%	1.80%	2.65%	0.75%	−0.25%
1000000	1000000	11/02/2011	11/02/2011	4.75%	1.15%	1.80%	2.65%	0.75%	−0.25%
1000000	1000000	11/08/2011	11/08/2011	4.75%	1.15%	1.80%	2.65%	0.75%	−0.25%
1000000	1000000	11/02/2012	11/02/2012	4.75%	1.15%	1.80%	2.65%	0.75%	−0.25%
1000000	1000000	11/08/2012	11/08/2012	4.75%	1.15%	1.80%	2.65%	0.75%	−0.25%
1000000	1000000	11/02/2013	11/02/2013	4.75%	1.15%	1.80%	2.65%	0.75%	−0.25%

Table 3: *Input (Vectors) of IRS Variabile Protetto Differenziale template loaded on "Parameters & Functions" Fairmat enviroment.*

Other input that user finds into "*Parameters & Functions*" *Fairmat* enviroment are:

- **RdayA**: (Party A) number of days before *Initial* (*Advance*) / *Ending* (*Arrears*) period;
- **RdayB**: (Party B) number of days before *Initial* (*Advance*) / *Ending* (*Arrears*) period;
- **matEur**: time horizon of Euribor rate expressed into year fraction;
- **matCMS1**: time horizon of CMS rate n.1, expressed into year fraction. It is used as argument of **D** function;
- **matCMS2**: time horizon of CMS rate n.2, expressed into year fraction. It is used as argument of **D** function;
- **tenor1**: payment frequency of CMS rate n.1 (exchange per year);
- **tenor2**: payment frequency of CMS rate n.2 (exchange per year);
- **timeF1**: number of periods with using of **f1** function (or before using **f2** function);
- **D**: analytic function expression of differential between **matCMS1**-Year and **matCMS2**-Year CMS rates. It is used as argument of **f2** analytic function;
- **f1**: analytic function expression of *Party A* payoff from 1 to **timeF1**;
- **f2**: analytic function expression of *Party A* payoff from **timeF1**+1 to **TD**;
- **PdA**: date's vector transformation from **pduA** vector (see Table 3);
- **PdB**: date's vector transformation from **pduB** vector (see Table 3);

- **RdA**: date's vector transformation from **pduA** vector (see Table 3) using **RdayA** constant;
- **RdB**: date's vector transformation from **pduB** vector (see Table 3) using **RdayB** constant;
- **DurA**: date's vector difference transformation from **pduA** vector (see Table 3);
- **DurB**: date's vector difference transformation from **pduB** vector (see Table 3);
- **zr**: *zero* rate (derived from *spot* rate);
- **TD**: number of last payment date (e.g. semi-annual payment with time horizon 8 year equals to 16 payments, $1/0.5 * 8$).