

Package CDS

Heidi Chen

(joint work with David Kane, Yang Lu, and Kanishka Malik)

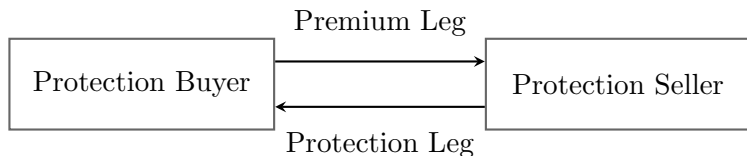
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Single-Name CDS

- A transfer of credit risk between two parties
- The buyer pays a stream of coupon payments in order to receive a one-off, contingent payment in the case of a credit event

Figure : Mechanics of a CDS contract



The ISDA Standard Model

- Standardized coupon, recovery rate, and first accrual dates
- Conversion between conventional spread and upfront payments



Existing Tools - Bloomberg CDSW

Analyze Credit Derivative Menu XEROX CDS USD SR 5Y Corp CDSW Message ☆ 📄 ⚙️ ?

<HELP> for explanation.

90 Actions 91 Products 92 View Credit Default Swap Valuation

Cpty CDS CNTRPARTY Client CCP DTC Ticker /XRX Series Deal#

31 Load 32 Save 34 Ticket 35 Refresh 36 Settings 39 Send to VCON/TR

Deal

Buy Notional 1 MM USD Contract SNAC

REF Entity Xerox Corp

Debt Type Senior Restructuring NR

REF Obligation US984121BW26 RED Pair Code 9HC533AE0

Trade Date 04/22/14 Trd Sprd (bp) 105.8000

1st Accr Start 03/20/14 Backstop Date 02/21/14

1st Coupon 06/20/14 Coupon (bp) 100.000

Pen Coupon 03/20/19 Day Cnt ACT/360 Freq Q

Maturity 5Y 06/20/19 Pay AI True Date Gen I

Use Curve Recovery Rate True Business Days 5D

Recovery Rate 0.40 Bus Day Adj 1 Amrt N

Calculator ISDA Standard Upfront Model (1)

Cash Settled On 04/25/14 Valuation Date 04/22/14

Cash Calculated On 04/25/14

Price 99.71931785 Spread DV01 482.55

Principal 2,806 IR DV01 -0.74

Accrued (34 Days) -944 Rec Risk (1%) -2.08

Cash Amount 1,862 Def Exposure 597,193

Market

Curve Date 04/22/14

Swap Curve 260 Mid

5) View USD ISDA Standard Curve

CDS Curve C CMAN Ask

6) View XRX USD Senior Curve (CSDS)

Recovery Rate 0.40

Term	Pts Upf	Spread	Prob
06/20/19	0.280682	105.8000	0.0880

View Historical Data 3 Month

• This application is based on the ISDA Std Model v1, developed and supported in collaboration with Markit Group Ltd.

Existing Tools - Markit Calculator

CDS Reference Entity And Contract Terms

Xerox Corp (R) Required

Trade Details

Ticker/Company (R) Red Code
 Trade Date (R) Buyer/Seller (R)
 Trade Level by (R)

CDS Contract Terms

Maturity Date (R) Running Cpn bps (R)
 Notional (MM) (R) Tier (R)
 Currency (R) Recovery Rate % (R)
 Counterparty Restructuring (R)

Advanced Terms

Cash Settlement Roll Code
 Holiday Code Day Count Conv
 Payment Freq Step In Date

[Calculate](#) [Clear All](#)

E-mail Results [Send](#)

Please note:

All cash flows and default probabilities correspond to the trade level and trade maturity.
 Maturities correspond to: IMM dates

Credit Curve

Maturity	Markit EOD	Transform Method <input type="text" value="Proportional"/>	
		Transformed	Default Prob
6M	105.800	bps	1.1756 %
1Y	105.800	bps	2.0506 %
2Y	105.800	bps	3.7868 %
3Y	105.800	bps	5.4877 %
4Y	105.800	bps	7.1565 %
5Y	105.800	bps	8.7997 %
7Y	105.800	bps	12.0000 %
10Y	105.800	bps	16.5890 %
15Y	105.800	bps	23.7093 %
20Y	105.800	bps	30.2218 %
30Y	105.800	bps	41.6292 %

[Recalculate](#)

Calculation Results

Market Value	1,862
Cash Settlement	1,862
Accrued Days	34
Accrued Amt	944.44
Currency	USD

Details

[Show Cash Flows](#)

	Transformed	User
Market Value	1,862	1,862
Clean Price	99.72 %	99.72 %
Cash Settlement	1,862	1,862
Accrued Days	34	34
Accrued Amt	944.44	944.44
Credit DV01	483	483
IR DV01	-1	-1

Yield Curve

Date
 Snap TimeZone: New York

[Recalculate](#)

Period	Type	Rate
1M	Deposit	0.1522 %
2M	Deposit	0.1929 %
3M	Deposit	0.2259 %
6M	Deposit	0.3198 %
1Y	Deposit	0.5465 %
2Y	Swap	0.5380 %
3Y	Swap	1.0000 %
4Y	Swap	1.4475 %
5Y	Swap	1.8165 %
6Y	Swap	2.1180 %
7Y	Swap	2.3490 %
8Y	Swap	2.5430 %
9Y	Swap	2.6955 %
10Y	Swap	2.8250 %
12Y	Swap	3.0275 %
15Y	Swap	3.2285 %
20Y	Swap	3.3970 %
25Y	Swap	3.4730 %
30Y	Swap	3.5070 %

Interest Rate Conventions

Spot Date: 24-Apr-2014 Swap DCC: 30/360
 MM DCC: A/360 Swap Interval: 6M
 Floating DCC: A/360 Holidays: none
 Floating Interval: 3M Bad Day Conv: MF

Package CDS

```
> library(CDS)
> cds1 = CDS(entityName = "Xerox",
+           RED = "9HC533",
+           TDate = "2014-04-22",
+           maturity = "5Y",
+           notional = 1e6,
+           coupon = 100,
+           parSpread = 105.8)
> summary(cds1)
```

Contract Type:	SNAC	TDate:	2014-04-22
Entity Name:	Xerox	RED:	9HC533
Currency:	USD	End Date:	2019-06-20
Spread:	105.8	Coupon:	100
Upfront:	1,862	Spread DV01:	483
IR DV01:	-0.74	Rec Risk (1 pct):	-2.12

Package CDS

Calculator		ISDA Standard Upfront Model (I)	
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Cash Calculated On	04/25/14		
Price	99.71931785	Spread DV01	482.55
Principal	2,806	IR DV01	-0.74
Accrued (34 Days)	-944	Rec Risk (1%)	-2.08
Cash Amount	1,862	Def Exposure	597,193

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Contract Type:          SNAC      TDate:                2014-04-22
Entity Name:           Xerox      RED:                  9HC533
Currency:              USD        End Date:             2019-06-20
Spread:                105.8     Coupon:               100
Upfront:               1,862     Spread DV01:         483
IR DV01:              -0.74     Rec Risk (1 pct):   -2.12
```

```
> cds1@defaultExpo
```

```
[1] 597193.4
```


Package CDS

Benchmark	S260 (USD ISDA Standard Curve - Mid)		
Date	04/22/2014		
Term	Rate	Term	Rate
1 Month	0.1522	12 Year	3.0275
2 Month	0.1929	15 Year	3.2285
3 Month	0.2259	20 Year	3.3970
6 Month	0.3198	25 Year	3.4730
12 Month	0.5465	30 Year	3.5070
2 Year	0.5380		
3 Year	1.0000		
4 Year	1.4475		
5 Year	1.8165		
6 Year	2.1180		
7 Year	2.3490		
8 Year	2.5430		
9 Year	2.6955		
10 Year	2.8250		

```
> cds1
```

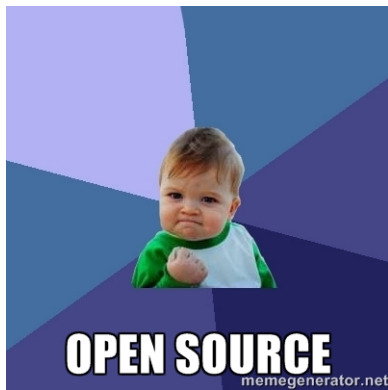
```
...
```

```
Credit curve effective of 2014-04-22
```

Term	Rate	Term	Rate
1M	0.001522	7Y	0.023490
2M	0.001929	8Y	0.025430
3M	0.002259	9Y	0.026955
6M	0.003198	10Y	0.028250
1Y	0.005465	12Y	0.030275
2Y	0.005380	15Y	0.032285
3Y	0.010000	20Y	0.033970
4Y	0.014475	25Y	0.034730
5Y	0.018165	30Y	0.035070
6Y	0.021180		

We Welcome Feature
Requests!

Thank You!



CDS Package: <http://cran.r-project.org/web/packages/CDS/index.html>

Repository: <https://github.com/yl2/CDS>

Vignette: <http://cran.r-project.org/web/packages/CDS/vignettes/CDS.pdf>

Contact: s.heidi.chen@gmail.com