

Increasing the Effectiveness of Hedging Interest Rate and Foreign Exchange Risks

"Being able to work with both foreign exchange and interest rates in the same software environment has reduced the learning curve it takes to value instruments. FINCAD Analytics works with just about everything we do."

Brian Moore, Manager of Financial Markets, McDonald's



COMPANY OVERVIEW

McDonald's Corporation (McDonald's) is the world's leading and best known global food-service retailer, with nearly 29,000 restaurants in more than 120 countries. In 1967, McDonald's opened its first foreign country franchise in Canada. Today, more than 65% of total revenue is derived internationally, as more and more restaurants are opened in countries outside the United States, increasing McDonald's foreign exchange and interest rate risks. McDonald's Treasury is challenged with managing these risks. This is no small task, as hedging the interest rate and foreign exchange risks for operations based in foreign countries is complex.

McDonald's Treasury is divided into four areas – Cash Management, Financial Markets, Domestic Finance, and International Finance. The Cash Management team takes care of the administration and back office duties of the treasury, while the Domestic Finance and International Finance areas manage the banking relationships for McDonald's Corporation, franchisees, and suppliers.

The Financial Markets group is responsible for hedging the balance sheet and income statement against foreign exchange and interest rate risks, while funding the growth of global operations. They often fund assets locally, but in many markets this is challenging. The assets are funded by more than \$8 billion in debt, with over 50% of the debt denominated in a foreign currency. McDonald's uses swaps and options in managing their financial risks.

THE NEED

Brian Moore, Manager of Financial Markets at McDonald's, identified a need to further increase the effectiveness of the interest rate and foreign exchange hedging programs. He and his team wanted to implement a leading-edge solution that would help achieve this goal while containing costs. They also needed to maintain consistency with the long-standing risk management policy requiring Treasury to be able to price and manage every derivative they transact. To maximize the hedge coverage while minimizing the hedge cost, Brian Moore and Darin Aprati, Foreign Exchange Manager at McDonald's, used basket option strategies to hedge their interest rate and foreign exchange risks. A basket option is an option whose payoff depends on the value of a portfolio (or basket) of assets.

McDonald's was looking for an upgrade in technology to help the Treasury build the currency basket option, so the search began...

THE SOLUTION

McDonald's hedges their interest rate and foreign exchange exposures, which are made up of foreign income and assets and their domestic and foreign debt portfolio, by using the following approaches:

- Qualitative Analysis – uses the underlying economic fundamentals for each country, and the currency is analyzed to determine when it is necessary to hedge.

- Quantitative Analysis – relies on mathematical models to analyze assets vs. liabilities implies using different weightings of different baskets. Much of this is done using random scenario simulations, however, McDonald's needed tools to measure hedge effectiveness.

McDonald's evaluated several system-based software solutions to evaluate hedge effectiveness, but they lacked the flexibility and the analytical coverage needed to price many of the complex derivatives. "Big systems lack flexibility and functionality, plus they are harder to link to market data," stated Aprati. "The technology just didn't exist to do what we needed," he added.

In 1996, Moore and Aprati chose FINCAD's Microsoft® Excel based financial engineering software as a pricing tool. FINCAD Analytics Suite for Excel allows McDonald's to price their derivatives portfolio, enabling them to work more efficiently with instruments such as basket, average rate and double average rate options. These exotic currency options allow them to hedge their exposures in a more cost-effective manner.

The payoff for a double average rate option is:

$$\text{MAX} \left(\phi \left(\frac{S_{T_i}}{N_T} - \frac{S_{K_i}}{N_K}, 0 \right) \right)$$

Where:

ϕ is 1 for a call and -1 for a put

S_{T_i} is the sum of the spot prices

N_T is the number of sampling points for the spot prices

S_{K_i} is the sum of the strike prices

Example of one of the option models used.

Case Study *continued*

McDonald's can now run simulations in Microsoft Excel to test the effectiveness of their hedges. When they are dealing with exotic option models, they can easily confirm that they match the risks that are being hedged.

McDonald's also uses FINCAD Analytics to analyze their portfolio of interest rate swaps, currency swaps, and swaptions. "Being able to work with both foreign exchange and interest rates in the same software environment has reduced the learning curve it takes to value instruments," Moore states. "FINCAD Analytics works with just about everything we do," Moore added.

Moore and Aprati built spreadsheet templates for these instruments and linked them to live market data from Reuters® and Bloomberg®. This enables them to calculate mark-to-market values in real time.

"In implementing the solution, the FINCAD support staff was very responsive in meeting McDonald's needs for financial instrument valuation," stated Aprati. "FINCAD proactively incorporated an option function into their software before we even requested it, which saved us a lot of time," Aprati adds. FINCAD listens to its customers and continues to improve its product based on user feedback and industry trends.

TECHNOLOGY

As part of their hedging technology solution, the Financial Markets Group uses Reuters and Bloomberg live data feeds to retrieve current & historical interest rates and foreign exchange data. They use the curve building, swap, and option pricing tools in FINCAD Analytics. The team uses PC based solutions generally, though they also have a deal capture system to handle the fixed income portfolio. At trade time they use FINCAD to confirm pricing using real-time data.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	VANILLA BASKET OPTION CALCULATOR																
2																	
3	3:49 PM																
4	Terms:		Composition:		1		2		3		4		5		6		
5	Value date	26-Mar-01	Currency	EUR	GBP	JPY	CAD	AUD									
6	Expiration date	31-Dec-05	Notional amount	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000									
7	Strike price	\$ 35,507,986	USD equivalent	\$ 9,348,299	\$ 14,484,868	\$ 102,105	\$ 6,528,451	\$ 5,044,263	\$ -								
8	Option type	Put	Implicit strike price	0.9348	1.4485	97.9384	1.5318	0.5044	-								
9	Strike value	\$ 35,507,986	Option type	Put	Put	Put	Put	Put									
10	Spot value	\$ 35,107,053	Component value		\$ 809,250	\$ 957,587	\$ 8,805	\$ 264,564	\$ 440,119	\$ -							
11	Forward value	\$ 35,507,986															
12	Basket volatility	7.85%															
13	Days remaining	1,741															
14	Results:		Links:														
15	Strip Value	\$ 2,480,326	Current spot rate	0.9113	1.4476	120.8200	1.5508	0.4987	-								
16	Basket Value	\$ 1,859,738	Outright forward rate	0.9348	1.4485	97.9384	1.5318	0.5044	-								
17	Delta Ratio	0.3614	Volatility	12.85%	9.80%	12.80%	6.00%	12.95%	0.00%								
18			U.S. interest rate	5.47%	5.47%	5.47%	5.47%	5.47%	0.00%								
19			Foreign interest rate	4.81%	5.45%	0.52%	5.15%	5.17%	0.00%								
20			Fair value [CCY/USD]	0.0950	0.0457	10.4187	0.0628	0.1750	-								
21																	
22			USD spot equivalent	\$ 9,113,000	\$ 14,476,000	\$ 82,768	\$ 6,448,285	\$ 4,987,000	\$ -								
23			USD fwd equivalent	\$ 9,348,299	\$ 14,484,868	\$ 102,105	\$ 6,528,451	\$ 5,044,263	\$ -								
24																	
25																	

In the vanilla option basket screen above, you can see that with a basket of 6 currencies and a notional amount of \$10 million various spot rates, forward rates, etc., are directly feed from Reuters which then feed into the model, giving instantaneous valuations such as the strike price in US dollars. This vanilla option continues to save McDonald's significant costs, as the premiums are usually lower on basket options than on separate options on each of the basket's components.

CONTACTS

Corporate Headquarters
Central City, Suite 1750
13450 102nd Avenue
Surrey, BC V3T 5X3 Canada

EMEA Sales & Client Service Center
Block 4, Blackrock Business Park
Carysfort Avenue, Blackrock
Co Dublin, Ireland

USA/Canada 1.800.304.0702
Europe 00.800.304.07020
London +44.20.7495.3334
Dublin +353.1.400.3100
Elsewhere +1.604.957.1200
Fax +1.604.957.1201
Email info@fincad.com



FINCAD®