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Implied Volatilities and Spreads Between HEL Sequentials and Credit Card ABSs

Many of the major factors that drive nominal spreads on credit card and home equity loan (HEL) securities are the same, including liquidity valuations, consumer credit issues, servicer's financial strength and headline risk. It is therefore not surprising that the spreads on these products generally follow the same market trends. Nevertheless, they do not move in parallel. Over the past four years, the difference between the spreads on three- and five-year triple-A-rated HEL and credit card securities has covered a wide range, from about 20bp to well over 100bp. One of the main reasons for the difference in spreads, of course, is the prepayment option cost embedded in HEL bonds. The market recognition of its changing value, in response to a variety of factors, is then reflected in the time dependence of the difference in spreads.

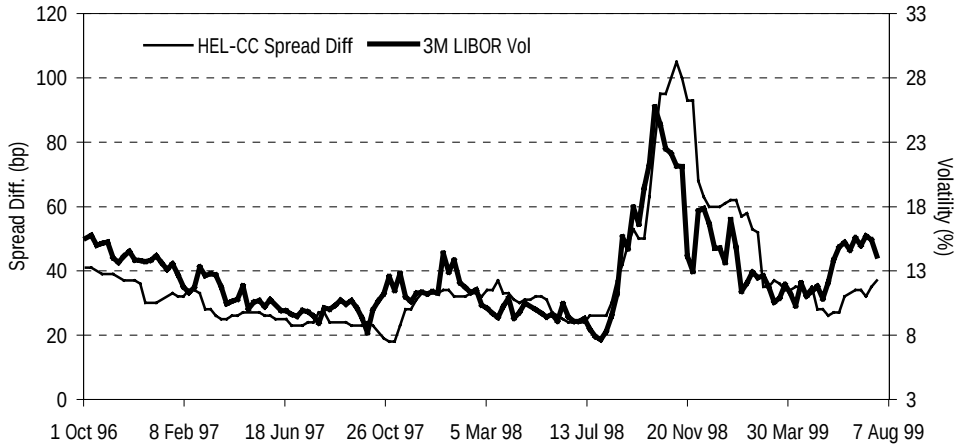
Compared to agency collateral, HELs prepay at high speeds even in the absence of interest-rate incentives, allowing for a significant slowdown of prepayments in a rate selloff. Their prepayment response to rate shifts is relatively uniform across a wide range of rates, 2 implying that the option cost is less a function of how far in or out of the money the collateral is than of the deal structure and the likelihood of a rate move (in either direction). The market expectation of the probability of various rate

[2] See, for example, Bond Market Roundup: Strategy, Salomon Smith Barney, April 9, 1999.

shifts is parametrized by implied volatility. It therefore appears reasonable that implied volatility should be correlated with the investors' valuation of the cost of the prepayment option on HEL securities, and so with the difference in nominal spreads between credit card and HEL bonds.

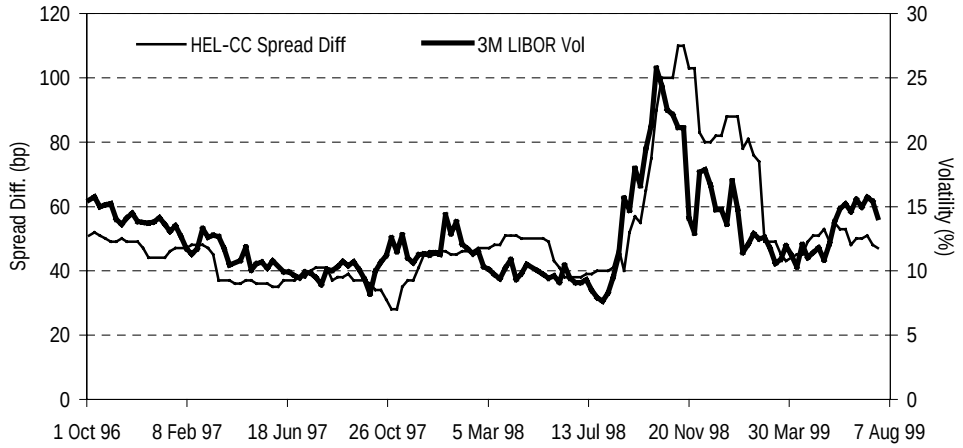
Figure 7 shows the difference in nominal spreads between a three-year HEL sequential bond and a three-year credit card bullet, together with the implied volatility of the three-month LIBOR rate six months forward.[3] Figure 8 shows the analogous difference in nominal spreads for five-year bonds and the same graph of implied volatility. We have chosen to start the time series at the beginning of the fourth quarter of 1996, which coincides with the introduction of NAS bonds into virtually all HEL deals. Since NASs have a substantial impact on the option cost of the three- and five-year sequentials, the spread data before this time are not directly comparable to the period displayed. The data displayed are weekly.

Figure 7. Implied Volatilities and Nominal Spread Differences Between Three-Year Triple-A-Rated HEL and Credit Card Securities



Source: Salomon Smith Barney.

Figure 8. Implied Volatilities and Nominal Spread Differences Between Five-Year Triple-A-Rated HEL and Credit Card Securities



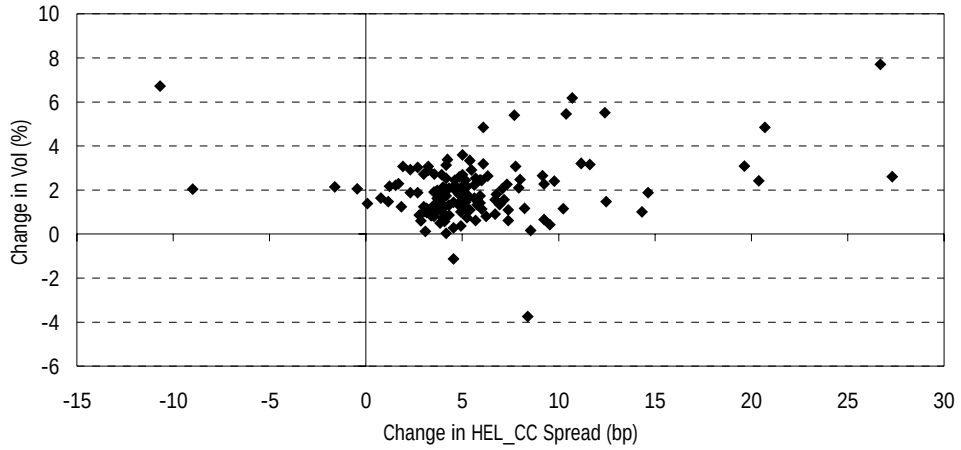
Source: Salomon Smith Barney.

[3] This implied volatility is generally representative of a family of implied volatilities that can be used to determine the option cost in an OAS framework.

The differences between HEL and credit card spreads tracked implied volatilities closely over the last four years, over a wide range of values of both quantities and during significant movements in interest rates.[4] The observed pattern can therefore be taken as a confirmation of the view that nominal spreads on HEL sequentials clearly take into account the cost of the prepayment option.

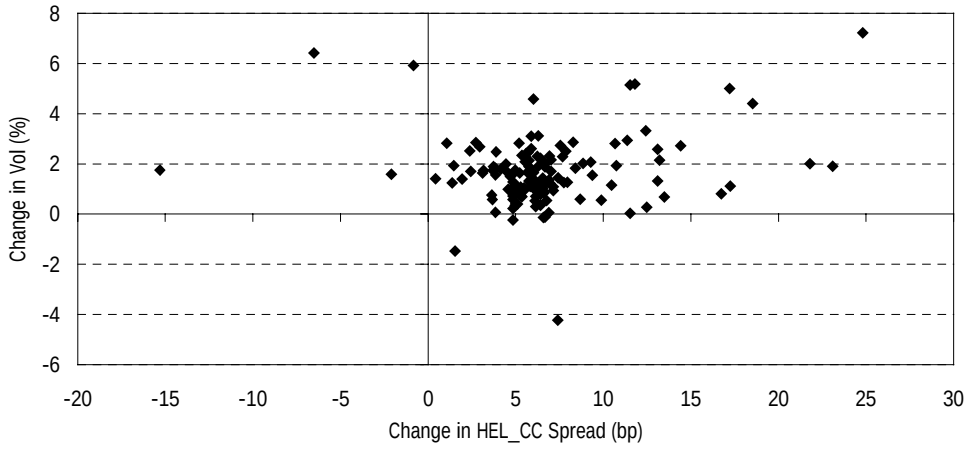
To assess the statistical significance of the relationship suggested by Figures 7 and 8, we examine the dependence of *changes* in the level of difference between HEL and credit card spreads on *change*s in the level of volatilities. The results are displayed in Figures 9 and 10. While the dispersion between points is substantial, the figures do suggest a positive correlation between the quantities.

Figure 9. Changes in Difference Between Three-Year HEL and Credit Card ABSs Versus Changes in Implied Volatility



Source: Salomon Smith Barney.

Figure 10. Changes in Difference Between Five-Year HEL and Credit Card ABSs Versus Changes in Implied Volatility



Source: Salomon Smith Barney.

[4] The conforming mortgage rates, for example, spanned about 170bp over this period.

Noise in the data, which is evident in Figures 9 and 10, can be reduced by focusing on *monthly* rather than weekly changes in the levels. This reduction also makes the results directly relevant to investors who mark their positions to market on a monthly basis. In this case, the correlation between changes in the difference between three-year HEL and credit card spreads and changes in implied volatilities is about 60%, while the analogous correlation for five-year securities is about 50%. These numbers imply that the correspondence between HEL and credit card spreads and implied volatilities shown in Figures 7 and 8 is not coincidental but represents a significant relationship with predictive power (at least on a monthly basis).

A straightforward application of this relationship is a comparison of valuations of HEL sequentials and credit card bullets relative to the level of implied volatilities. As Figures 7 and 8 suggest, the significant runup in implied volatilities since May 1999 has not been matched by a corresponding increase in the difference between HEL and credit card spreads. Therefore, after adjustment for prepayment option costs, three- and five-year HEL sequentials appear rich relative to credit cards. This conclusion agrees with a direct comparison of the OASs on HEL bonds with the static spreads on credit card ABSs.[5]

Figure 11. Percentage of ABS Floating-Rate and Fixed-Rate Issuance, 1998–1999 Year-to-Date

	1998	1999
Floating-Rate	40.3%	45.8%
Fixed-Rate	59.7	54.2

Source: Salomon Smith Barney.

Figure 12. Year-to-Date ABS Issuance by Sector, 1998–1999 (Dollars in Millions)

	1998 (YTD)	Percentage	1999 (YTD)	Percentage
Auto Loans	$22,104.2	20.2%	$35,014.7	27.2%
Credit Cards	22,011.7	20.1	23,912.2	18.5
Home Equity Loans	41,034.4	37.5	27,291.5	21.2
Manufactured Housing	7,330.7	6.7	5,559.4	4.3
Student Loans	8,264.2	7.5	4,027.3	3.1
Other	8,803.5	8.0	33,133.3	25.7
Total	**$109,548.9**	**100.0%**	**$128,938.3**	**100.0%**

Source: MCM "Corporatewatch."

Figure 13. Comparison of Quoted Spreads and Static Spreads

	Avg. Life	Quoted Spread (bp/Curve)	Static Spread[a]	Difference
Three-Year Bullet	3.00 Yrs	78bp	78bp	0bp
Five-Year Bullet	5.00	98	85	13
Wide Window Auto[b]	1.81	80	77	3
Short Auto[c]	1.06	L+18	67	NA
Wide Window HEL[d]	3.63	170	162	8
Short HEL[e]	1.16	L+50	99	NA

[a] Static spread of bullets incorporates the richness or cheapness of the on-the-run Treasury benchmarks. [b] Assumes collateral original WAM of 60 months and remaining WAM of 54 months, 9% coupon, 1.3% ABS prepayment speed. [c] Assumes collateral original WAM of 60 months and remaining WAM of 30 months, 9% coupon, 1.3% ABS prepayment speed. [d] Assumes collateral remaining WAM of 174 months, 11% coupon, 20% CPR prepayment speed. [e] Assumes collateral remaining WAM of 120 months, 11% coupon, 20% CPR prepayment speed, security maturity in 30 months. CPR Constant prepayment rate. HEL Home equity loan–backed securities. NA Not available. WAM Weighted average maturity.
Source: Salomon Smith Barney.

[5] See *Bond Market Roundup: Strategy*, Salomon Smith Barney, July 16, 1999.

Figure 14. Fixed-Rate ABS Secondary-Market Spreads to Benchmark Treasuries

		AAA					A				
		23 Jul 99 Spread	Spread Changes Over 1 Week	4 Weeks	52 Weeks	1-Year SD of 1-Week Sprd Chgs	23 Jul 99 Spread	Spread Changes Over 1 Week	4 Weeks	52 Weeks	1-Year SD of 1-Week Sprd Chgs
2-Year	Retail Auto	82bp	0bp	15bp	42bp	5.6bp	105bp	0bp	18bp	47bp	9.2bp
	Credit Card	75	0	15	37	4.8	95	0	9	40	5.7
	Home Equity	130	20	40	77	9.0	NA				
	Man. Housing	120	15	33	70	8.5	NA				
3-Year	Wholesale Auto	78	0	14	38	4.9	100	0	18	43	5.3
	Credit Card	78	0	14	38	4.8	100	0	18	43	5.3
	Home Equity	140	25	42	74	9.1	NA				
	Man. Housing	130	20	37	75	7.9	NA				
5-Year	Wholesale Auto	98	0	15	51	6.3	123	0	20	58	7.3
	Credit Card	98	0	15	51	6.3	123	0	20	58	7.3
	Home Equity	160	15	27	73	9.0	NA				
	Man. Housing	150	15	33	85	8.9	NA				
7-Year	Wholesale Auto	95	0	18	44	7.3	125	0	25	55	8.4
	Credit Card	95	0	18	44	7.3	125	0	25	55	8.4
	Home Equity	180	15	30	78	10.7	NA				
	Man. Housing	170	15	43	90	10.2	NA				
10-Year[a]	Wholesale Auto	115	0	15	52	8.4	145	0	15	62	8.9
	Credit Card	115	0	15	52	8.4	145	0	15	62	8.9
	Home Equity	205	15	30	85	13.0	NA				
	Man. Housing	195	20	40	97	11.5	NA				

Note: Five- and ten-year spreads are quoted versus on-the-run Treasuries; two-, three-, and seven-year spreads are quoted versus off-the-run Treasuries.[a] On May 21, the benchmark Treasury was changed for the ten-year to the on-the-run bond, causing distortions in historical comparisons. SD Standard deviation. Source: Salomon Smith Barney.

Figure 15. Floating-Rate ABS Secondary-Market Discount Margins (Over One-Month LIBOR)

		AAA					A				
		23 Jul 99 Spread	Spread Changes Over 1 Week	4 Weeks	52 Weeks	1-Year SD of 1-Week Sprd Chgs	23 Jul 99 Spread	Spread Changes Over 1 Week	4 Weeks	52 Weeks	1-Year SD of 1-Week Sprd Chgs
2-Year	Retail Auto	15bp	0bp	3bp	12bp	1.9bp	31bp	0bp	-1bp	14bp	2.7bp
	Credit Card	14	1	4	11	1.8	35	5	5	18	2.7
	Home Equity	35	4	8	27	3.6	90	0	6	62	7.2
3-Year	Wholesale Auto	17	1	4	12	1.9	40	5	8	18	2.6
	Credit Card	17	1	4	12	1.9	40	5	8	18	2.7
	Home Equity	40	7	11	27	3.4	95	0	3	64	7.8
5-Year	Wholesale Auto	22	1	3	13	2.1	45	2	6	19	3.1
	Credit Card	22	1	3	13	2.1	45	2	6	19	3.1
	Home Equity	45	10	15	30	3.7	105	5	10	72	8.5
7-Year	Wholesale Auto	27	1	4	15	2.5	52	4	7	22	4.0
	Credit Card	27	1	4	15	2.5	52	4	7	22	3.9
10-Year	Wholesale Auto	32	0	3	15	3.9	65	0	3	29	4.1
	Credit Card	32	0	3	15	3.9	65	0	3	29	4.1

LIBOR London Interbank Offered Rate. SD Standard deviation.
Source: Salomon Smith Barney.

Figure 16. Representative Secondary Trading Levels

Floating-Rate Issue		Avg. Life	DM	Price		Cap
MBNA 97-N A		1.3Yrs	10	99-30		None
FUSAM 95-2 A		2.6	16	100-06		None
CCIMT96.5 A		4.1	18	99-23		None
MBNA 96-B A		6.6	26	100-00		None
FUSAM 98-6 A		9.0	30	98-31+		None
Fixed-Rate Issue	**Coupon**	**Avg. Life**	**Spread**	**Price**	**Yield**	**Static Spread**
ONYX 98-1 A	5.95	1.3@1.6 ABS Yrs	110bp	100-17	5.57%	3bp
PRAT 98-3 A3	5.88	1.0@1.5 ABS	80	99-25	6.17	82
CHAS 98-C A4	5.85	2.2@1.5 ABS	84	98-28	6.48	82
CCIMT 98-1 A	5.75	1.5	74	99-10	6.25	75
FUSAM 97-6 A	6.42	3.0	78	99-30	6.52	78
MBNA 97-I A	6.55	5.0	98	99-01	6.87	96
CCIMT 98-2 A	6.05	8.5	115	99-20	6.11	4

Source: Salomon Smith Barney.

Figure 17. Floating-Rate CLO and CDO Indicative Discount Margins (Over Three-Month LIBOR)

	US Collateral, Prime-Quality CLO		High Yield Collateral CDO	
	Balance-Sheet-Driven		Investor-Driven	
	3-Year	5-Year	7-Year	10-Year
AAA	25 bp	34 bp	65 bp	80 bp
AA	—	—	90	100
A	55	65	140	160
BBB	—	—	250	260
BB	—	—	550	570

CLO Collateralized loan obligation. CDO Collateralized debt obligation.
Source: Salomon Smith Barney.

Figure 18. Recent Issuance

Date	Issuer	Asset Type	Class	Size (Mil.)	Credit Enhancement	WAL (Yrs)	Pricing Speed	Spread
29 Jul 99	SAST (SAXON) 1999-3	HL	A-F1	$154.10		0.92		25/1M LIBOR
			A-F2	70.00		2.04		125/6.625 7/01
			A-F3	67.00		3.05		140/6.00 7/02
			A-F4	56.00		5.11		165/7.25 8/04
			A-F5	32.00		7.34		188/7.00 7/06
			A-F6	42.10		6.22		155/6.50 8/05
			MF-1	24.60		5.34		185/7.25 8/04
			MF-2	19.70		5.34		240/7.25 8/04
			B-F1	14.70		5.34		364/7.25 8/04
			B-F1A	12.30		0.83		230/10M LIBOR
			A-V1	202.50		2.40		32/1M LIBOR
			A-V2	77.90		2.40		37/1M LIBOR
			M-V1	27.70		4.70		59/1M LIBOR
			M-V2	23.20		4.60		115/1M LIBOR
			B-V1	14.30		4.50		TBD
			B-V1A	11.60		0.90		TBD
29 Jul 99	PP&L Transition Bonds 1999-1[a]		A-1	$154.00		1.00		23/SYNTH LIBOR
			A-2	93.00		2.00		83/6.50 8/01
			A-3	157.00		3.00		88/6.25 8/02
			A-4	101.00		4.00		93/5.75 8/03
			A-5	163.00		5.00		100/7.25 8/04
			A-6	112.00		6.00		103/6.50 8/05
			A-7	233.00		7.22		105/6.50 10/06
			A-8	229.00		8.74		120/5.625 5/08
28 Jul 99	Aames Mortgage Loan Trust 1999-1	HL	A-F	$191.24	100% FSA	3.68		155/5.50 3/03
			A-V	202.04	Surety Bond	2.66		40/1M LIBOR
28 Jul 99	First Chicago Master Trust II 1999-Y[a]			$550.00				20/1M LIBOR
27 Jul 99	EQCC 1999-3	HL	A-1	$350.00	AMBAC Surety Bond	0.98		35/EDSF
			A-2	137.00		2.06		115/6.50 8/01
			A-3	160.00		3.15		130/5.875 9/02
			A-4	80.00		4.98		154/7.25 8/04
			A-5	27.70		6.66		170/6.875 5/06
			A-6	133.00		6.23		137/5.875 11/05
			A-1A	37.80		2.62		31/1M LIBOR
23 Jul 99	Honda Auto Lease Trust 1999-A[a]	ALE	A-1	$380.00		0.39		4/5M LIBOR
			A-2	360.00		1.00		24/SYNTH LIBOR
			A-3	400.00		1.50		90/4.50 1/01
			A-4	1,000.00		2.04		96/6.50 8/01
			A-5	807.00		2.63		110/6.25 2/02
			B	66.00		2.63		120/6.25 2/02
			C	66.00		2.63		135/6.25 2/02
22 Jul 99	Massachusetts RBB Special Purpose Trust BEC-1[a]	O	A-1	$108.50	Sr./Sub.	1.09		20/SYNTH LIBOR
			A-2	170.60		3.13		80/6.50 8/02
			A-3	103.40		5.13		85/7.25 8/04
			A-4	170.90		7.13		97/7.00 7/06
			A-5	171.60		9.63		125/5.5 5/09
22 Jul 99	USAA Auto Loan GT 1999-1[a]	AL	A	$673.15		1.57		87/5.375 2/01

[a] Salomon Smith Barney has acted as a manager and/or co-manager of debt issues of this issuer within the past three years.
ABS Asset-backed securities. AD Auto dealer floor plan. AIR Airplane leases. AL Auto loan. ALE Automobile lease. BL Boat loan. CA Controlled amortization. CC Credit card. CCA Cash collateral account. CHC Charge card. CIA Collateral invested amount. CON Consumer loans. DF Dealer floor plan. EL Equipment loan. FEL Farm equipment loan. FF Fed funds. Whole first and second liens. FR Franchise loan. HE Home equity. HIL Home Improvement loan. MB Mortgage-backed. Mezz. Mezzanine. MH Manufactured housing. ML Motorcycle Loans. N/A Not available. O Other. OC Overcollateralized. RIC Retail installment contracts. RV Recreational vehicle. BA Small business association loans. SL Student loan. TL Truck loan. Sub. Subordinate. UBA Utility bill allocations. WAL Weighted average life. WHL Wholesale inventory. WI When issued.
Source: MCM "Corporatewatch."