Synthetic Lease Purchase of an Asset Using a HELOC

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Abstract

This paper illustrates how an individual with access to a home equity line of credit (HELOC) can effectively structure a synthetic lease financing arrangement for a car that allows for the deduction of interest expense. The paper begins by illustrating the difference between amortizing a loan to zero (full amortization) and amortizing a loan to a residual amount (partial amortization). I demonstrate how a lease financing arrangement for an asset is, in fact, a partially-amortized loan to the residual value of the asset. Next, I show how an individual with access to a HELOC can create a homemade synthetic lease financing arrangement that may allow for tax deductibility of the interest payments on the HELOC.I then address relevant features of the tax code that allow interest payments to be tax deductible. Finally, I discuss some potentially important differences between a conventional lease and the homemade synthetic lease.

Keywords: *amortization, lease, HELOC*

1. Introduction

Consumers face a buy versus lease decision for acquiring certain assets, such as a new car. While the lease option offers consumers the opportunity to get into a car at a lower monthly payment than a conventional loan (or to drive a more expensive car for a given monthly payment), the lessee will either need to make a large balloon payment at the end of the lease to keep the car or return it to the lessor. Individuals who employ their car for non-business purposes who can legally use their HELOC to finance the car, will likely choose this approach to gain the tax savings from deducting interest payments on the HELOC. This paper shows how that same individual can create a synthetic lease with the HELOC that allows the lower payments with interest payments that are tax deductible.

The remainder of this paper is organized as follows. The first section discusses the basic loan versus lease financing options for acquiring an asset, a new car. It shows how the monthly lease payments under both options can be determined using a basic time value of money formula. I also demonstrate that the loan vs. lease structures can be detailed using a full amortization and partial amortization approach, respectively. The second section discusses how an individual can create a synthetic lease that allows for the tax deduction of interest payments by borrowing against her home equity line of credit (HELOC). I also discuss some important differences between a traditional financial lease from a financial institution and our proposed synthetic lease financing approach using a HELOC. The third section discusses relevant features of the Internal Revenue Code that allows an individual to create a synthetic lease using home equity loan approach.

2. Fully Amortized Loan vs. Partial Amortization Lease Approach

Consider the financing of a car that has a final negotiated price of $33,000. I assume this negotiated price is invariant to the type of financing used to finance the car, i.e. whether it is financed with a conventional bank loan, financial lease, synthetic financial lease, or outright cash purchase. For comparison purposes, I assume the buyer makes a 10% down payment which lowers the loan amount to $30,000 and assume the lessor requires a 10% capital cost reduction to the same $30,000 amount. I assume a 36-month financing term for both the loan and lease options. I also initially assume that the annual nominal interest rate on both loans and leases is 6%, which is 0.50% per month.

The monthly payment of a traditional bank loan at an annual rate of 6% for 36 months is computed using the present value of an annuity formula:

$$PV = PMT\left[\frac{1-\frac{1}{(1+r)^n}}{r}\right]$$

Solving for the monthly payment:

$$PMT = \frac{PV}{\left[\frac{1-\frac{1}{(1+r)^n}}{r}\right]} = \frac{\$30{,}000}{\left[\frac{1-\frac{1}{(1.005)^{36}}}{0.005}\right]} = \$912.66$$

Determining the lease payment for a car requires estimating the residual value of the car. Assume the pre-determined residual value of the car at the initiation of the lease is $20,000. For time value of money purposes, I encourage students to think of the residual payment as the final balloon future value payment required when the lease expires at the end of month 36; the lessee either pays the bank $20,000 and takes ownership of the car or she returns the car, which has the pre-determined, estimated value if $20,000, to the lessor. (The lessor, of course, assumes the risk that the value of the car being returned could be less than $20,000.)

$$PV = PMT\left[\frac{1-\frac{1}{(1+r)^n}}{r}\right] + \frac{FV_{Residual\,Value}}{(1+r)^n}$$

Substituting:

$$30{,}000 = PMT\left[\frac{1-\frac{1}{(1.005)^{36}}}{.005}\right] + \frac{20{,}000}{(1.005)^{36}}$$

Solving the above equationI get: PMT = $404.22. Using a financial calculator, Enter 36 for N; 0.5 for I/YR; 30,000 for PV; and 20,000± for FV, and then press the PMT key. As expected, the traditional loan results in a much higher monthly payment, $912.66 versus $404.22. Of course, the buyer would own the car after making the higher monthly payments in the loan financing, so Iare not making a fair comparison by just comparing monthly payments (the lessee would need to pay $20,000 to the lessor if she wanted to own the car at the end of the lease.) The primary advantage of the lease approach to some buyers would be the much lower required monthly payments. The *full* amortization of the car using a traditional bank loan means that the $30,000 borrowed amount is fully amortized to zero over the 36-month term of the loan. Using the monthly payment of $912.66 calculated above, Table 1 (the more heavily-shaded section on the left side) shows the full amortization of the loan to a loan balance of $0. This full amortization is taught early to business students and is generally well understood. It is included here primarily for comparison purposes with the partial amortization (lease) financing.

Table 1: Amortization of $30,000 using Full vs. Partial Amortization at 6% for 36 Months

Month	Full Amortization of $30,000 Loan to $0 Balance at 6%					Partial Amortization (Lease) to $20,000 Residual Value at 6%				
	Beginning Balance	Payment	Interest	Principal	Ending Balance	Beginning Balance	Payment	Interest	Principal	Ending Balance
1	$30,000.00	$912.66*	$150.00	$762.66	$29,237.34	$30,000.00	$404.22*	$150.00	$254.22	$29,745.78
2	29,237.34	912.66	146.19	766.47	28,470.87	29,745.78	404.22	148.73	255.49	29,490.29
3	28,470.87	912.66	142.35	770.30	27,700.57	29,490.29	404.22	147.45	256.77	29,233.52
4	27,700.57	912.66	138.50	774.16	26,926.41	29,233.52	404.22	146.17	258.05	28,975.47
5	26,926.41	912.66	134.63	778.03	26,148.39	28,975.47	404.22	144.88	259.34	28,716.13
6	26,148.39	912.66	130.74	781.92	25,366.47	28,716.13	404.22	143.58	260.64	28,455.49
7	25,366.47	912.66	126.83	785.83	24,580.64	28,455.49	404.22	142.28	261.94	28,193.55
8	24,580.64	912.66	122.90	789.75	23,790.89	28,193.55	404.22	140.97	263.25	27,930.30
9	23,790.89	912.66	118.95	793.70	22,997.18	27,930.30	404.22	139.65	264.57	27,665.73
10	22,997.18	912.66	114.99	797.67	22,199.51	27,665.73	404.22	138.33	265.89	27,399.84
11	22,199.51	912.66	111.00	801.66	21,397.85	27,399.84	404.22	137.00	267.22	27,132.62
12	21,397.85	912.66	106.99	805.67	20,592.18	27,132.62	404.22	135.66	268.56	26,864.06
13	20,592.18	912.66	102.96	809.70	19,782.49	26,864.06	404.22	134.32	269.90	26,594.16
14	19,782.49	912.66	98.91	813.75	18,968.74	26,594.16	404.22	132.97	271.25	26,322.91
15	18,968.74	912.66	94.84	817.81	18,150.93	26,322.91	404.22	131.61	272.60	26,050.31
16	18,150.93	912.66	90.75	821.90	17,329.02	26,050.31	404.22	130.25	273.97	25,776.34
17	17,329.02	912.66	86.65	826.01	16,503.01	25,776.34	404.22	128.88	275.34	25,501.00
18	16,503.01	912.66	82.52	830.14	15,672.87	25,501.00	404.22	127.51	276.71	25,224.29
19	15,672.87	912.66	78.36	834.29	14,838.57	25,224.29	404.22	126.12	278.10	24,946.19
20	14,838.57	912.66	74.19	838.47	14,000.11	24,946.19	404.22	124.73	279.49	24,666.70
21	14,000.11	912.66	70.00	842.66	13,157.45	24,666.70	404.22	123.33	280.89	24,385.82
22	13,157.45	912.66	65.79	846.87	12,310.58	24,385.82	404.22	121.93	282.29	24,103.53
23	12,310.58	912.66	61.55	851.11	11,459.47	24,103.53	404.22	120.52	283.70	23,819.82
24	11,459.47	912.66	57.30	855.36	10,604.11	23,819.82	404.22	119.10	285.12	23,534.70
25	10,604.11	912.66	53.02	859.64	9,744.48	23,534.70	404.22	117.67	286.55	23,248.16
26	9,744.48	912.66	48.72	863.94	8,880.54	23,248.16	404.22	116.24	287.98	22,960.18
27	8,880.54	912.66	44.40	868.26	8,012.28	22,960.18	404.22	114.80	289.42	22,670.76
28	8,012.28	912.66	40.06	872.60	7,139.69	22,670.76	404.22	113.35	290.87	22,379.90
29	7,139.69	912.66	35.70	876.96	6,262.73	22,379.90	404.22	111.90	292.32	22,087.58
30	6,262.73	912.66	31.31	881.34	5,381.38	22,087.58	404.22	110.44	293.78	21,793.79
31	5,381.38	912.66	26.91	885.75	4,495.63	21,793.79	404.22	108.97	295.25	21,498.54
32	4,495.63	912.66	22.48	890.18	3,605.45	21,498.54	404.22	107.49	296.73	21,201.82
33	3,605.45	912.66	18.03	894.63	2,710.82	21,201.82	404.22	106.01	298.21	20,903.61
34	2,710.82	912.66	13.55	899.10	1,811.72	20,903.61	404.22	104.52	299.70	20,603.90
35	1,811.72	912.66	9.06	903.60	908.12	20,603.90	404.22	103.02	301.20	20,302.70
36	908.12	912.66	4.54	908.12	**0.00**	20,302.70	404.22	101.51	302.71	**20,000.00**

*I used a PMT = $912.6581 to arrive at the terminal value of $0.00. If a rounded payment of $912.66 is used, the beginning balance is amortized to $0.74.

**I used a PMT = $404.2194 to arrive at the residual value of $20,000.00. If a rounded payment of $404.22 is used, the beginning balance is amortized to $19,999.98. The more lightly-shaded section to the right on Table 1 shows the *partial* amortization where the initial $30,000 amount that is being financed by the lease is amortized down to the $20,000 residual value amount at the end of the 36-month financing period. Assuming that the full amortization schedule was previously developed using an Excel spreadsheet, this partial amortization schedule is produced in Excel by simply changing the monthly payment from $912.66 to $404.22.

The $20,000 residual value is the resulting final balance when I use a monthly payment ($404.22) that is not sufficient to fully amortize the loan. As footnoted in the table, the monthly payments need 4 decimal places to amortize to $0.00 or $20,000.00.

3. Creating a Synthetic Lease with a HELOC

While lease financing provides lower monthly payments than a basic loan financing approach, it suffers from the disadvantage of not allowing any deduction of interest payments for tax purposes for an individual who has a sufficient line of credit in her HELOC. This disadvantage can be legally circumvented, however, if the individual creates her own synthetic lease. She constructs the synthetic lease by simply borrowing $30,000 from her HELOC. She then makes monthly payments of $404.22 for 36 months, which is the lease payment amount calculated in the previous section. After making the 36 monthly payments, she will owe $20,000 on her HELOC. She now faces the same choice as an individual who has leased a car from a financial institution: either she pays $20,000 (pays off her loan) and decides to keep her car or she must give up the car.

Table 2: Tax Savings from Interest Deduction for a Synthetic Lease at 45% Marginal Tax Rate: Amortization of $30,000 to Residual Value of $20,000 at 6% for 36 Months

Month	Payment	Interest	Tax Savings
1	$404.22[**]	$150.00	$67.50
2	404.22	148.73	66.93
3	404.22	147.45	66.35
4	404.22	146.17	65.78
5	404.22	144.88	65.19
6	404.22	143.58	64.61
7	404.22	142.28	64.02
8	404.22	140.97	63.44
9	404.22	139.65	62.84
10	404.22	138.33	62.25
11	404.22	137.00	61.65
12	404.22	135.66	61.05
13	404.22	134.32	60.44
14	404.22	132.97	59.84
15	404.22	131.61	59.23
16	404.22	130.25	58.61
17	404.22	128.88	58.00
18	404.22	127.51	57.38
19	404.22	126.12	56.75
20	404.22	124.73	56.13
21	404.22	123.33	55.50
22	404.22	121.93	54.87
23	404.22	120.52	54.23
24	404.22	119.10	53.59
25	404.22	117.67	52.95
26	404.22	116.24	52.31
27	404.22	114.80	51.66
28	404.22	113.35	51.01
29	404.22	111.90	50.35
30	404.22	110.44	49.70
31	404.22	108.97	49.04
32	404.22	107.49	48.37
33	404.22	106.01	47.70
34	404.22	104.52	47.03
35	404.22	103.02	46.36
36	404.22	101.51	45.68
Total	$2,048.35		
PV at 6%	$1,881.33		

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Provided that she meets the requirements under the Internal Revenue Code (discussed in the next section), she can deduct the interest portion of her synthetic lease payments on her personal tax returns. Table 2 shows the tax savings for an individual who faces a 45% federal-plus-state marginal tax rate for the $30,000 synthetic lease amortized to a residual value of $20,000 over three years at 6%. The total tax savings over three years is $2,048.35 and the present value of these tax savings at an opportunity cost of capital of 6% is $1,881.33. A key difference between the synthetic lease and the traditional lease is that she assumes the responsibility of selling the car (or trading it in) and assumes the risk that it might not be able to sell it or trade it in for the $20,000 estimated residual value, net of selling fees. She can lessen this risk by choosing a more conservative residual value. For example, if she chooses a $17,500 residual value, her lease payment increases to $467.77 and her total tax savings over three years falls slightly to $1,952.94; the present value of these savings at 6% is still $1,796.97. Financing a car through a HELOC may also allow for the car to be synthetically leased at a lower interest rate than a conventional lease or loan would provide. It is important to ignore advertised *special low interest rates* offered by dealers as these incentives can be translated into equivalent discounts off of the MSRP for the car, and I assume the negotiated $30,000 price in our example is the rock-bottom price with no further incentives possible. The synthetic lease financing through the HELOC would, however, likely introduce a variable interest rate approach as the rates on HELOCS usually vary according to some indexed reference interest rate. The lower but variable HELOC interest rates appear to introduce an offsetting advantage and disadvantage, respectively to the synthetic lease approach. Individuals would likely vary in their evaluation of this tradeoff.

Because a lessor grants a call option that allows the lessee to either buy the car at a stated price (residual value) or return it at the end of the lease term, lessors assume greater risk than financial institutions that provide conventional car loans. All else equal and ignoring any financing incentives, one would therefore expect the interest rate on a conventional lease to be slightly higher than the interest rate on a conventional car loan. Yet interest rates on HELOC loans are generally lower than traditional car loans because the property (a home) securing the loan serves as collateral for the car. On the other hand, some individuals may not be comfortable exposing their home to this collateral risk when financing their car and may therefore prefer the more conventional bank loan.

As discussed previously, an individual who creates a synthetic car loan faces a risk that the value of the car may be less than the estimated residual value used to structure the lease, i.e., determine the appropriate monthly lease payment. Lessors in a traditional car lease protect themselves from this risk by charging the lessee for miles driven in excess of a given amount and excess wear and tear beyond what would be expected. I argue that an individual who creates a synthetic lease must impose self-discipline (in place of the dealer-imposed discipline of penalties) to protect the car from excess mileage and wear and tear. If she does not, the reduced value of the car at the end of her synthetic lease is likely in line with the penalties that a dealer would have imposed in a traditional lease. Therefore, I do not view this as a major difference.

4. Applicable Internal Revenue Code Sections

Qualified residence interest is deductible for tax purposes under IRC §163. Subject to certain limitations discussed below, taxpayers with a qualifying HELOC can claim a tax deduction for interest expenses on a HELOC used to finance an auto loan purchase. IRC §163 outlines the requirements needed to make the "qualifying home" and "qualifying residence interest" determinations. Under IRC §163(h)(4)(A), a qualifying home includes both the taxpayer's primary residence and a second home, provided the requirements of §280A(d) are met (i.e., the taxpayer inhabits the second home for a minimum number of days, defined as the greater of (1) 14 days or (2) 10% of the number of days the second home is rented). IRC §163(h)(3)(C) defines qualifying home equity (HELOC) indebtedness as any indebtedness (other than debt used for the initial acquisition of the home) that is secured by a qualified residence (defined above), to the extent the aggregate amount of the HELOC does not exceed the fair market value of the home reduced by the amount of acquisition indebtedness with respect to the home (i.e., the "equity" the taxpayer has in the home). Provided the taxpayer's home is a qualifying home, the taxpayer has sufficient equity in the home, and the HELOC loan amount does not exceed $100,000 (or $50,000 for married-filing-separate taxpayers), interest on the HELOC can be deducted for regular tax purposes. In addition to the requirements discussed above, taxpayers considering the HELOC synthetic lease option must consider two potential limitations that may reduce or preclude tax deduction of the HELOC interest:

Alternative Minimum Tax (AMT):

While interest on home equity loans is deductible as an itemized deduction for regular tax purposes (as discussed above), under IRC §56(e)(1) HELOC interest is only deductible for AMT purposes if it was used to improve the home. Thus, if a taxpayer is subject to AMT, interest on a HELOC used to finance an auto purchase will not be deductible.

Overall Limitation on Itemized Deductions:

IRC §68 provides an overall limitation on itemized deductions. Under this section, if a taxpayer's adjusted gross income exceeds $305,050 (for married filing joint or $254,200 for single filers), the total itemized deductions are reduced by the smaller of (1) 80% of itemized deductions affected by the limit (as outlined in the regulations, including HELOC interest) or (2) 3% of the amount by which adjusted gross income exceeds the limits listed above.

5. Conclusion

This paper illustrates how an individual with access to a home equity line of credit (HELOC) can create a synthetic lease financing arrangement for a car that allows for the deduction of interest payments on the loan. The synthetic lease might appeal to individuals who also prefer the lower monthly payments associated with a lease. However, because there is no dealer agreement to buy back the car at a pre-specified price, the individual bears more price risk at the end of the lease term than in a conventional lease. Some individuals would likely accept the additional price risk and the burden of disposing the car in exchange for the lower interest rate on most HELOCs and the interest tax savings that can be attained.