Financial Engineering Your Mortgage For Better Than Market Returns

A while back a fellow blogger and friend of mine, Mr. 1500 or 1500days.com, wrote a piece on whether you should pay your mortgage off early or not. I don't disagree with his logic as it makes perfect sense. However, like many things in personal finance, I have a hard time with absolutes. Instead "it depends" is a much better answer. Today I am going to make the case for paying off your mortgage early, given the right circumstances are in place. Depending on your own personal goals and circumstances, this may be a viable option for you to consider.

Usually the argument goes that you should keep your mortgage, especially given the historically low interest rates. The thought process, which I don't disagree with, is that if you can borrow at say 3.75% for a 30 year mortgage, and invest at say an 8% return by investing in a broad based index fund like the SPY (tracks to S&P 500). In theory you should do this all day long every day. There is also the argument for liquidity. It's true you have faster access to cash by liquidating your investments than you do in tapping the equity in your house (unless you have a home equity line of credit).

On the other hand paying extra principal on your mortgage to pay it off early is getting you a guaranteed return equal to that of your interest rate. But maybe that is not enough to entice you, you say "I am willing to take the risk for closer to market returns." What if I told you that it's possible to engineer better than market returns through strategic refinancing and accelerated repayment? Again, this does not apply to everyone, but this is an example based on my own personal experience.

The Back Story

My wife and I were in the market to buy a house as we were tired of paying the ridiculous $3,100/month in rent. No doubt we were living the high life (literally in a high rise) and in luxury. The affluence in our high rise apartments was crazy. We ended up here after giving up on our original house hunt in early 2013. House prices in Orange County were ridiculously high, and we didn't love anything we

were seeing. We also were not very fond of signing up for a $750,000 mortgage either, after PMI & Taxes, we would have had a payment of $5,100/month. So, we opted to live in luxury (a sort of limbo if you will) while we reevaluated our options.

After a year of living the baller lifestyle, we decided to do a little domestic geo-arbitrage and move about an hour inland in order to get access to a housing market that was way less expensive. Where houses were going for half the price and were 4-5X the size.

We wanted to buy a house so that we could stop throwing money down the drain and start building some equity. But we also wanted to save a substantial amount from what we were currently paying in rent.

Mortgage #1

We found the house for us on our first outing with our real estate agent. Actually we had been looking for a few months online and narrowed our list down to the top 3 to see in person. Number 2 would be the lucky winner. We paid $370,000 and financed $355,000 of that purchase price. Since we only put about 4% down, we ended up with an FHA loan that cost us $6,000. We didn't have much in the way of closing costs since our agent was a family friend and did the deal pro bono, and my wife is in the escrow business. After everything was said and done we were responsible for about $1,500 in closing costs on top of the $6,000 for the FHA loan.

Total Investment = $22,500

Free Cash Flow* = $895.28/month or $10,743/year

Annual Cash on Cash Return = 47.7%

Free Cash flow was calculated by taking the difference of $3,100 in rent vs. new mortgage payment of $2,710.77 (includes property taxes, HOA, and PMI). The initial savings between these two was $389.23. Because interest and property taxes are tax deductible, we need to add $506.06 in monthly tax savings (based on 30% tax rate, which is conservative) for a total of **$895.28/month in total savings.*

***The loan we took out was a 30 year FHA loan at 3.75% with 1.35% PMI for the life*

of the loan.

This was a no brainer for us. I couldn't invest in anything that I know of for this sort of guaranteed return. And to put things into perspective further, in order to earn the same $10,743 by investing for an 8% return, one would have to invest $134,288 (or about 6X our total investment). Or, if you wanted a to earn the same from a safe CD, at 2% you would have to lock up $537,150.

Refinance #1 [Mortgage #2]

As much as we hated to go with an FHA loan, it was really the only option we had based on what we were willing to put as a down payment at the time. However, the plan was always to refinance out of the FHA loan as quickly as possible, if to only save the 1.35% we would have to pay in PMI for the life of the loan (these requirements have since changed).

Within 8 months of taking out the first loan we found the opportunity we had been looking for to refinance our loan to remove PMI without 20% down. We joined a credit union that was offering a 5/5 option ARM at 3.625% with **zero** origination fees and **zero** points. We would be able to get this refinance done for about $1,000.

Incremental Investment = $1,000

Free Cash Flow* = $438.13/month or $5,257.56/year

Annual Cash on Cash Return = 526%

Total Return Profile after 1st Refinance [Cumulative]

Total Investment = ($22,500 + $1,000) = $23,500

Free Cash Flow* = $1,333.41/month or $16,000.92/year

Annual Cash on Cash Return = 68%

A whopping 68% return, again I have no idea where you can get these types of

returns, if you are aware of them, please let me know. Also, in order to achieve the same $16,000 in cash flow from investing at 8%, one would have to invest $200,011. Or $800,000 in a CD earning 2%.

**Keep in mind that investment is what could had been invested in the market, but instead was put towards the mortgage.*

About 4 months into the new 5/5 ARM, we had finalized our plan to pay the mortgage off early. One of the major hypotheses was that the the market would return much less than historical returns and that there was a high probability that we would soon be entering a recession. In plain English we believed and continue to believe that the imputed 3.625% that we would be earning by making extra payments to the mortgage would be better than what would be earned in the markets over the next 5-7 years.

If we are wrong, the worst that would happen is that we under-perform the market (or would we???), but would still have a house that was free and clear earning the equivalent of 3.625%. Now I should also add that this was not in lieu of investing, it was in addition. We also do not allocate any of our funds to bonds, as we look at a paid off mortgage as a bond substitute.

So over the last 19 months we have systematically paid an additional $16,000 in principal on top of the normal loan amortizations (this was as of April 2016).

We realize that this dilutes our annual cash on cash return.

Incremental Investment = $16,000 @ 3.625%

Annual Cash on Cash Return = 3.625% [equivalent]

Weighted Average Return (before refinance #2)

Total Investment = ($23,500 + $16,000) = $39,500

Annual Cash on Cash Return = [($16,000 * 3.625%) + ($23,500 * 68%)] /

$39,500 = 42% [weighted]

**Keep in mind that investment is what could had been invested in the market, but instead was put towards the mortgage.*

Refinance #2 [Mortgage #3]

We were not really looking to refinance per say, but with market volatility heating up and rates dropping, it got us curious. At first we considered refinancing our investment condo, but found out that we could not for various reasons that I will not go into here. Then we wondered what a refinance would look like on our house. Specifically a cash-in refinance. Since we didn't yet have an 80% loan to value (LTV), we would need to bring money into the deal.

This time we decided to go with a 3/1 ARM that again was through the same credit union and the cost would be $1,000. The loan itself was **zero** origination and **zero** points with a starting interest rate of 2.25%. This time it was going to require that we bring in $21,000 in order to get the 80% LTV.

Incremental Investment = $22,000

Free Cash Flow* = $382.11/month or $4,585.36/year

Annual Cash on Cash Return = 21%

So, the question that is probably going through your head, or that should be going through your head, is "what will the blended return be over the life."

In order to calculate the annual return on investment, we have to cash flow the savings and investment by month, so that we can get annual figures. These figures are going to vary a bit from the numbers mentioned above, as they are cash flowed based on actual savings and investments.

Month	Month	Investment	Savings	Notes
1	2/28/2014	$ (22,500)	$ 895	30 Year FHA Loan @ 3.75% Interest, $6,000 premium (with 1.35% premium), $1,500 closing costs, $15,000 down payment. Monthly Savings = $895.28
2	3/31/2014	$ -	$ 895	
3	4/30/2014	$ -	$ 895	
4	5/31/2014	$ -	$ 895	
5	6/30/2014	$ -	$ 895	
6	7/31/2014	$ -	$ 895	
7	8/31/2014	$ -	$ 895	
8	9/30/2014	$ (1,000)	$ 1,333	Refinance #1 to a 5/5 ARM at 3.625%, $1,000 in closing costs. Additional Monthly Savings = $438.13
9	10/31/2014	$ -	$ 1,333	
10	11/30/2014	$ -	$ 1,333	
11	12/31/2014	$ -	$ 1,333	
12	1/31/2015	$ (800)	$ 1,336	Started making $800/month in additional principal payments; effectively saving 3.625% Yield; start of 7 year payoff plan
13	2/28/2015	$ (800)	$ 1,338	
14	3/31/2015	$ (800)	$ 1,341	
15	4/30/2015	$ (800)	$ 1,343	
16	5/31/2015	$ (800)	$ 1,345	
17	6/30/2015	$ (800)	$ 1,348	
18	7/31/2015	$ (800)	$ 1,350	
19	8/31/2015	$ (800)	$ 1,353	
20	9/30/2015	$ (800)	$ 1,355	
21	10/31/2015	$ (800)	$ 1,358	
22	11/30/2015	$ (800)	$ 1,360	
23	12/31/2015	$ (800)	$ 1,362	
24	1/31/2016	$ (1,600)	$ 1,367	Started making $1,600/month in additional principal payments; effectively saving 3.625% Yield
25	2/29/2016	$ (1,600)	$ 1,372	
26	3/31/2016	$ (1,600)	$ 1,377	
27	4/30/2016	$ (1,600)	$ 1,382	
28	5/31/2016	$ -	$ 1,382	
29	6/30/2016	$ (22,000)	$ 1,764	Refinance #2 to a 3/1 ARM at 2.25%, $1,000 in closing costs, $21,000 cash in. Additional Monthly Savings = $382.11
30	7/31/2016	$ -	$ 1,764	
31	8/31/2016	$ -	$ 1,764	
32	9/30/2016	$ -	$ 1,764	
33	10/31/2016	$ -	$ 1,764	
34	11/30/2016	$ -	$ 1,764	
35	12/31/2016	$ -	$ 1,764	
36	1/31/2017	$ -	$ 1,764	
37	2/28/2017	$ -	$ 1,764	
38	3/31/2017	$ -	$ 1,764	
39	4/30/2017	$ -	$ 1,764	
40	5/31/2017	$ (2,400)	$ 1,768	
41	6/30/2017	$ (2,400)	$ 1,773	
42	7/31/2017	$ (2,400)	$ 1,777	
43	8/31/2017	$ (2,400)	$ 1,782	
44	9/30/2017	$ (2,400)	$ 1,786	
45	10/31/2017	$ (2,400)	$ 1,791	
46	11/30/2017	$ (2,400)	$ 1,795	
47	12/31/2017	$ (2,400)	$ 1,800	
48	1/31/2018	$ (3,200)	$ 1,806	
49	2/28/2018	$ (3,200)	$ 1,812	
50	3/31/2018	$ (3,200)	$ 1,818	
51	4/30/2018	$ (3,200)	$ 1,824	
52	5/31/2018	$ (3,200)	$ 1,830	
53	6/30/2018	$ (3,200)	$ 1,836	
54	7/31/2018	$ (3,200)	$ 1,842	
55	8/31/2018	$ (3,200)	$ 1,848	
56	9/30/2018	$ (3,200)	$ 1,854	
57	10/31/2018	$ (3,200)	$ 1,860	
58	11/30/2018	$ (3,200)	$ 1,866	
59	12/31/2018	$ (3,200)	$ 1,872	
60	1/31/2019	$ (4,000)	$ 1,879	
61	2/28/2019	$ (4,000)	$ 1,887	
62	3/31/2019	$ (4,000)	$ 1,894	
63	4/30/2019	$ (4,000)	$ 1,902	
64	5/31/2019	$ (4,000)	$ 1,909	
65	6/30/2019	$ (4,000)	$ 1,917	
66	7/31/2019	$ (4,000)	$ 1,924	
67	8/31/2019	$ (4,000)	$ 1,932	
68	9/30/2019	$ (4,000)	$ 1,939	
69	10/31/2019	$ (4,000)	$ 1,947	
70	11/30/2019	$ (4,000)	$ 1,954	
71	12/31/2019	$ (4,000)	$ 1,962	
72	1/31/2020	$ (4,800)	$ 1,971	
73	2/29/2020	$ (4,800)	$ 1,980	
74	3/31/2020	$ (4,800)	$ 1,989	
75	4/30/2020	$ (4,800)	$ 1,998	
76	5/31/2020	$ (4,800)	$ 2,007	
77	6/30/2020	$ (4,800)	$ 2,016	
78	7/31/2020	$ (4,800)	$ 2,025	
79	8/31/2020	$ (4,800)	$ 2,034	
80	9/30/2020	$ (4,800)	$ 2,043	
81	10/31/2020	$ (4,800)	$ 2,052	
82	11/30/2020	$ (4,800)	$ 2,061	
83	12/31/2020	$ (4,800)	$ 2,070	
84	1/31/2021	$ (5,400)	$ 2,080	
85	2/28/2021	$ (5,400)	$ 2,090	
86	3/31/2021	$ (5,400)	$ 2,100	
87	4/30/2021	$ (5,400)	$ 2,110	
88	5/31/2021	$ (5,400)	$ 2,120	
89	6/30/2021	$ (5,400)	$ 2,131	
90	7/31/2021	$ (5,400)	$ 2,141	
91	8/31/2021	$ (5,400)	$ 2,151	
92	9/30/2021	$ (5,400)	$ 2,161	
93	10/31/2021	$ (5,400)	$ 2,171	
94	11/30/2021	$ (5,400)	$ 2,181	
95	12/31/2021	$ (5,400)	$ 2,191	
96	1/31/2022	$ (660)	$ 2,193	

Now that we have the table built out with the timing of investment vs. savings, we can go ahead and figure out what the annual return profile is looking like.

Remember that a dollar saved is equivalent to a dollar earned.

Actually it could even be argued that a dollar saved is greater than a dollar earned, as it has already been taxed, so you get to keep 100% of the savings. The alternative is you have to give X% of every additional dollar you earn to the government. Look at those returns created in the first 4 years…they make me very happy

It’s amazing that we have already saved almost $50K since buying our house (we will complete YR 3 in February 2017).

Year	Investment	Cum. Investment	Savings	Cum. Savings	Return
1	$ (24,300)	$ (24,300)	$12,936	$ 12,936	53.2%
2	$ (10,400)	$ (34,700)	$16,221	$ 29,157	46.7%
3	$ (26,800)	$ (61,500)	$19,623	$ 48,781	31.9%
4	$ (22,400)	$ (83,900)	$21,370	$ 70,151	25.5%
5	$ (39,200)	$ (123,100)	$22,140	$ 92,291	18.0%
6	$ (48,800)	$ (171,900)	$23,139	$ 115,429	13.5%
7	$ (58,200)	$ (230,100)	$24,353	$ 139,783	10.6%
8	$ (60,060)	$ (290,160)	$25,741	$ 165,523	8.9%
9	0	$ (290,160)	$25,741	$ 191,264	8.9%
10	0	$ (290,160)	$25,741	$ 217,004	8.9%
11	0	$ (290,160)	$25,741	$ 242,745	8.9%
12	0	$ (290,160)	$25,741	$ 268,486	8.9%
13	0	$ (290,160)	$25,741	$ 294,226	8.9%
14	0	$ (290,160)	$25,741	$ 319,967	8.9%
15	0	$ (290,160)	$25,741	$ 345,707	8.9%
16	0	$ (290,160)	$25,741	$ 371,448	8.9%
17	0	$ (290,160)	$25,741	$ 397,189	8.9%
18	0	$ (290,160)	$25,741	$ 422,929	8.9%
19	0	$ (290,160)	$25,741	$ 448,670	8.9%
20	0	$ (290,160)	$25,741	$ 474,410	8.9%
21	0	$ (290,160)	$25,741	$ 500,151	8.9%
22	0	$ (290,160)	$25,741	$ 525,892	8.9%
23	0	$ (290,160)	$25,741	$ 551,632	8.9%
24	0	$ (290,160)	$25,741	$ 577,373	8.9%
25	0	$ (290,160)	$25,741	$ 603,113	8.9%
26	0	$ (290,160)	$25,741	$ 628,854	8.9%
27	0	$ (290,160)	$25,741	$ 654,595	8.9%
28	0	$ (290,160)	$25,741	$ 680,335	8.9%
29	0	$ (290,160)	$25,741	$ 706,076	8.9%
30	0	$ (290,160)	$25,741	$ 731,817	8.9%

Total Return	252%

Update: I should point out that the returns you see in the above table are not compounded returns. The compounded return over the 30 year duration would be 4.3%. If you want the quick easy math for converting a total return over a certain time period into a compounded annual return visit this link.

In the table above you can see that I continued the annual savings of $25,741/year through 30 years in order to calculate the total savings over the life of the typical mortgage length. We never intended to keep our mortgage for 30 years, but we did plan to enjoy the savings we financially engineered over the full length of the mortgage. If you really think about it, once you have a paid off mortgage, you have essentially created a synthetic dividend for life.

Wow! Looks like you can synthetically create a better than "market" return using your own mortgage combined with a little strategic refinancing and through financial engineering, voila. This is just another way to answer the question of "should I pay my mortgage off early."

What do you think? Is this math surprising to you? I don't think I have seen this done anywhere else online. Again the circumstances have to be right, this won't work out the same for everyone. Also in the post that Mr. 1500 did that I linked to in the beginning of this post, he was contemplating paying cash for his house vs. investing...same question, but different variables. The point of this post is really to show you that there are rarely absolutes, and many permutations to what may seem like the same question.

– Gen Y Finance Guy

Gen Y Finance Guy

Hey, I’m Dom - the man behind the cartoon. You’ll notice that I sign off as "Gen Y Finance Guy" on all my posts, due to the fact that I write this blog anonymously (at least for now). I like to think of myself as the *Chief Freedom Officer* here of my little corner of the internet. In the real world, I’m a 30-something former C-Suite executive turned entrepreneur turned capital allocator. I am trying to humanize finance by sharing my own journey to Financial Freedom. I believe in total *honesty* and *transparency*. That is why before I ever started blogging, I decided that I would share all of my own financial stats. I do this not to brag, but instead to inspire motivate, and also to hold myself accountable. My goal is to be a beacon of hope, motivation, and inspiration for *you*, the reader, by living life by example and sharing it **all** here on the blog. My sincere hope is that you will be able to learn from me - both from my successes and my failures! Read More